# Academic Program Assessment Report

**Academic Year(s) Assessed: 2025-2026**
**College: College of Agriculture**
**Department: Agricultural Economics & Economics**
**Department Head: Eric Belasco**
**Submitted by: Wendy Stock, Certifying Officer for DAEE AGBE programs**

## Program(s) Assessed

List all majors (including each option), minors, and certificates that are included in this assessment – add or subtract rows as needed – please use official titles:

| Majors | Minors, Options, etc. |
|---|---|
| Agricultural Business | Farm and Ranch Management, Agribusiness Management |

## Section 1. Past Assessment Summary.

Response:

The AOC reviewed the AY 2024-25 AGBE report and rated all six report elements Outstanding. Reviewers asked for three additions: a description of how RIC members scored student work and kept their scoring consistent, a more specific account of how instructors acted on the findings, and concrete Closing the Loop steps, particularly for students' graphing skills. Sections 5, 7 and 8 of this report add each of these.

## Section 2. Institutional Assessment Data Request.

Based on the rationale on the Instructions page, please review your program learning outcomes (PLOs) and identify whether you have PLOs that address the Core Qualities. **There are no right or wrong answers.**

Identify 1-2 major-required courses that might have student assignments designed to meet these objectives at least at a surface level. If you cannot identify a course in your program that aligns with this request, please check the appropriate box. At this juncture, this is for information gathering as we plan future institutional assessment endeavors.

| **Core Quality LOs are Institutional Learning Outcome (ILO)** | **PLO overlaps with MSU Core Quality**<br><br>Mark X if program has at least one PLO that overlaps with an ILO | **Beginning Level**<br><br>e.g. CORE Courses (US, W, Q, IN, CS, IA, IH, IS, D) | **Developing Level**<br><br>e.g. list one 200- or 300-level course | **Proficient Level**<br><br>e.g. list one 300- or 400-level courses, Capstone, Research (R) Core courses | **Not Applicable (N/A)**<br><br>No course exists in our program that addresses this Core Quality / ILO |
|---|---|---|---|---|---|
| Thinkers & Problem Solvers | X | Core classes are designed to address an introductory, foundational level of Core Qualities. Some may overlap into the developing level, but most intermediate-to-developing or proficient/mastery level courses will exist within the majors. | AGBE 210 | AGBE 451RS, AGBE 341, AGBE 445, AGBE 345 | |
| Effective Communicators | X | | AGBE 210 | AGBE 451 RS | |
| Local & Global Citizen | | | ECNS 101, AGBE 210 | ECNS 303<br>ECNS 314<br>ECNS 317 | |

**Section 3. Actionable Research Question for Your Assessment.**
Response:

Can DAEE AGBE students describe and classify firm- and farm-level decision rules for the efficient operation of enterprises, apply those rules to new situations, and compare the outcomes when the rules are applied differently?

**Section 4. Assessment Plan, Schedule, and Data Sources.**

a) Did you change the previously established Assessment Plan Schedule. If yes, how was it changed?

**None**

b) Please provide a multi-year assessment schedule that will show when all program learning outcomes will be assessed, and by what criteria (data). List your PLOs in full for reference. Add rows as necessary.

| | **DAEE AGBE Assessment Schedule** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PLO# | PROGRAM LEARNING OUTCOME | 2022-2023 | 2023-2024 | 2024-2025 | 2025-2026 | 2026-2027 | 2027-2028 | Data Source* |
| 1 | Apply & Analyze: Demonstrate an understanding of how markets operate, use information in new situations to compare the pre-post effects of government policies in markets | X | | | | | | AGBE 210<br>ECNS 101<br>ECNS 204<br>AGBE 445<br>AGBE 451 |
| 2 | Apply & Evaluate & Analyze: Apply skills in mathematical and analytical reasoning and statistical techniques to analyze changes in market behavior or policies, and evaluate the impacts of these changes on buyers, sellers, and other stakeholders | | | X | | | | ECNS 204<br>ECNS 301<br>AGBE 341<br>AGBE 345 |
| 3 | Understand & Apply: Explain ideas or concepts presented in articles in business and economics journals, apply those concepts to new situations | | X | | | | | AGBE 445 AGBE 451 |
| 4 | Understand & Apply & Evaluate: Describe and classify firm and farm level | | | | X | | | AGBE 210<br>ECNS 204<br>AGBE 341 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | decision rules for the efficient operation of enterprises, apply those rules to new situations, compare and contrast outcomes based differential implementation of the rules, evaluate and critique the institutional structure and use of agricultural marketing systems | | | | | | | AGBE 321<br>AGBE 421 |
| 5 | Analyze & Evaluate: Appraise the impacts of changes in market and general economic conditions in a broad array of settings, weigh the impacts of the policies on various groups affected by those changes. | | | | | | X | AGBE 210<br>ECNS 204<br>AGBE 451 |
| 6 | Create: Investigate outcomes and changes in agricultural industries, develop a research paper based on those outcomes or changes, present ideas effectively in oral and written forms | | | | | X | | AGBE 451RS |

*Assignments or exams from the listed courses can be used as student artifacts for the program assessment, students in lower-level courses are expected to demonstrate beginning and developing skills, while students in upper-level courses are expected to demonstrate competency and accomplishment.

c) What are the threshold values for which your program demonstrates student achievement? Provide a rationale for your threshold values.

| Threshold Values | | |
|---|---|---|
| PROGRAM LEARNING OUTCOME | Threshold Value | Data Source |
| 1) Apply & Analyze: Demonstrate an understanding of how markets operate, use information in new situations to compare the pre-post effects of government policies in markets | The threshold value for beginning and developing for this outcome is for 75% of assessed students to score above 1 on a 1-4 scoring rubric. The threshold value for competency and accomplishment for this outcome is for 75% of assessed students to score above 3 on a 1-4 scoring rubric. | Randomly selected student assignments or exams |
| 2) Apply & Evaluate & Analyze: Apply skills in mathematical and analytical reasoning and statistical techniques to analyze changes in market behavior or policies, and evaluate the impacts of these changes on buyers, sellers, and other stakeholders | The threshold value for beginning and developing for this outcome is for 75% of assessed students to score above 1 on a 1-4 scoring rubric. The threshold value for competency and accomplishment | Randomly selected student assignments or exams |

| | | |
|---|---|---|
| | for this outcome is for 75% of assessed students to score above 3 on a 1-4 scoring rubric. | |
| 3) Understand & Apply: Explain ideas or concepts presented in articles in business and economics journals, apply those concepts to new situations | The threshold value for beginning and developing for this outcome is for 75% of assessed students to score above 1 on a 1-4 scoring rubric. The threshold value for competency and accomplishment for this outcome is for 75% of assessed students to score above 3 on a 1-4 scoring rubric. | Randomly selected student assignments or exams |
| 4) Understand & Apply & Evaluate: Describe and classify firm and farm level decision rules for the efficient operation of enterprises, apply those rules to new situations, compare and contrast outcomes based differential implementation of the rules, evaluate and critique the institutional structure and use of agricultural marketing systems | The threshold value for beginning and developing for this outcome is for 75% of assessed students to score above 1 on a 1-4 scoring rubric. The threshold value for competency and accomplishment for this outcome is for 75% of assessed students to score above 3 on a 1-4 scoring rubric. | Randomly selected student assignments or exams |
| 5) Analyze & Evaluate: Appraise the impacts of changes in market and general economic conditions in a broad array of settings, weigh the impacts of the policies on various groups affected by those changes | The threshold value for beginning and developing for this outcome is for 75% of assessed students to score above 1 on a 1-4 scoring rubric. The threshold value for competency and accomplishment for this outcome is for 75% of assessed students to score above 3 on a 1-4 scoring rubric. | Randomly selected student assignments or exams |
| 6) Create: Investigate outcomes and changes in agricultural industries, develop a research paper based on those outcomes or changes, present ideas effectively in oral and written forms | The threshold value for beginning and developing for this outcome is for 75% of assessed students to score above 1 on a 1-4 scoring rubric. The threshold value for competency and accomplishment for this outcome is for 75% of assessed students to score above 3 on a 1-4 scoring rubric. | Randomly selected student assignments or exams |

These threshold values distinguish between beginning/developing learners and competent/accomplished learners.

**Section 5. What Was Done?**

d) Self-reporting Metric (required answer): Was the completed assessment consistent with the program's assessment plan? If not, please explain the adjustments that were made.

**X** **Yes** ☐ **No**

e) How was the data collected and analyzed and by whom? Please include method of collection and sample size.

**The instructors of AGBE 321 and AGBE 341 gave the RIC copies of all student submissions for two questions on a lab assignment on the relevant PLO. The RIC then had Claude score each artifact independently against the rubric below, provide a summary of scores, and write a general conclusion regarding students' levels of understanding. For AGBE 341, the questions scored were for Part I (Pasture Cost Analysis) of Lab Exercise 6, with attention to question 8 (rent the pasture or raise beef). For AGBE 321 the questions scored were question 3 of Lab Exercise 6 (the wheat farmer's hedging problem, including the part 3e discussion). Submissions were scored by Claude on the 1-4 rubric below, and the full set of scores, rationales, and anonymized submissions is in Appendices A-C.**

f) Please provide a rubric that demonstrates how your data was evaluated.

| Indicators | Beginning - 1 | Developing- 2 | Competent- 3 | Accomplished- 4 |
|---|---|---|---|---|
| Understand & Apply & Evaluate: Describe and classify firm and farm level decision rules for the efficient operation of enterprises, apply those rules to new situations, compare and contrast outcomes based differential implementation of the rules, evaluate and critique the institutional structure and use of agricultural marketing systems | The student can state basic firm or farm decision rules but cannot classify them or apply them to a new situation | The student describes and classifies decision rules and applies them to a new situation, but cannot compare outcomes under different implementations or evaluate the marketing system involved | The student describes, classifies and applies decision rules, compares outcomes and evaluates the marketing system, with some mistakes or gaps in the comparison or evaluation | The student describes, classifies and applies decision rules, and compares outcomes and evaluates the marketing system without mistakes or gaps |

**Section 6. What Was Learned.**

g) Based on the analysis of the data, and compared to the threshold values established, what was learned from the assessment?

**We assessed PLO 4 using every submission from two courses: 42 AGBE 321 responses to question 3 of Lab Exercise 6 (hedging a wheat crop with futures) and 42 AGBE 341 responses to Part I of Lab Exercise 6 (pasture cost analysis), 84 artifacts in all. They were scored on the 1-4 rubric in Section 5f. Scores, rationales, and anonymized submissions are in Appendices A-C. Both thresholds were met in both courses. The beginning/developing threshold (75% of students scoring above 1) was met by 98% of AGBE 321 students (41 of 42) and 98% of AGBE 341 students (41 of 42). The competency threshold (75% of students scoring 3 or higher) was met by 90.5% of AGBE 321 students (38 of 42) and 81% of AGBE 341 students (34 of 42), and by 85.7% of the combined sample (72 of 84).**

**Mean scores were 3.14 in AGBE 321, 3.12 in AGBE 341, and 3.13 combined. Students in the 4 category made up 26% of AGBE 321 and 33% of AGBE 341. A score of 4 required no mistakes or gaps, so most students who scored 3 had a correct solution with a small error or a thin explanation. The competency margin is larger in AGBE 321 than in AGBE 341.**

| Course | n | Score 1 | Score 2 | Score 3 | Score 4 | % scoring 2+ | % scoring 3+ |
|---|---|---|---|---|---|---|---|
| AGBE 321 | 42 | 1 | 3 | 27 | 11 | 98% | 90.5% |
| AGBE 341 | 42 | 1 | 7 | 20 | 14 | 98% | 81% |
| Combined | 84 | 2 | 10 | 47 | 25 | 98% | 85.7% |

h) What areas of strength in the program were identified from this assessment process?

**Students in both courses applied the decision rules correctly in the large majority of cases. In AGBE 321, 38 of 42 correctly identified the farmer's natural long position and the short futures hedge, wrote or used the futures payoff, completed the table of local, futures, and total results at each July price (a constant $1.50 per bushel), and drew the graph. Eleven students scored 4: they also stated the July offsetting trade and explained in part 3e that hedging reduces variability but does not maximize profit, including the hedging loss when prices rise and the offsetting gain when prices fall.**

**In AGBE 341, nearly all students found the marginal-revenue-equals-marginal-cost herd sizes (175, 200, 125, and 75 cows), the profits and losses, the $40.91 shutdown price (the minimum average variable cost), the $132.35 price at which 225 cows is optimal, and the $81.88 long-run breakeven (the minimum average total cost). Fourteen students scored 4 with every answer correct and explained, including why the pasture makes this the short run and why raising beef beats renting once the pasture cost is counted ($6,682.50 against $5,000). The submissions came as typed documents, handwritten pages, and photographs, and the reasoning was equally visible in all formats.**

i) What areas were identified that either need improvement or could be improved in a different way from this assessment process?

**AGBE 321 hedging explanation (3e). Most of the points lost were in the final discussion and in the July step. At least ten AGBE 321 students did not clearly state the July offsetting trade (buying back the short futures position) or described it wrongly (selling again, or delivering on the contract), and about 15 gave a brief answer to 3e with no discussion of the hedging loss when prices rise or of variability versus profit maximization. A few students made sign errors in the futures column at the $9.25 price. Three students scored 2 and one scored 1 (this submission contained no table, graph, or discussion for 3c-3e).**

**AGBE 341 decision at question 8 and cost-curve wording. Six of 42 students (14%) answered question 8 wrongly, choosing to rent the pasture. Several compared the $25,000 rent with the $6,682.50 profit from raising beef, which ignores the $20,000 cost of the pasture, and one gave a decision with no profit comparison. In addition, about 12 students gave a loose or misattributed explanation for the $40.91 and $81.88 prices, for example tying the long-run breakeven to covering variable cost instead of total cost, and about 15 gave vague or very short answers to question 1 (short run versus long run). One student found the wrong herd sizes at every price (scored 1). Seven of the 42 scored 2 in AGBE 341, against three of 42 in AGBE 321, so AGBE 341 has the smaller margin.**

**Graphing. The AY 2024-25 review asked for more attention to graphing. In AGBE 321, about six of 42 students omitted the graph for 3d, mislabeled it, or reversed the lines for the local and futures positions. The AGBE 341 lab part scored here does not include a graph, so it does not test the graph-interpretation steps added in Section 8.**

**Coverage and process. The AGBE 321 and 341 questions test decision rules, application, and comparison of outcomes under different choices well. They test less of the PLO 4 element on evaluating the institutional structure and use of agricultural marketing systems, which is assessed only through the 3e hedging discussion. Next cycle we plan to add a marketing-systems evaluation question to the sample.**

**Suggested action for AGBE 341. Both courses met the thresholds, and AGBE 341 had the smaller competency margin (81% against 90.5%). Before Lab Exercise 6, the instructor will add a short in-class practice item on choosing between two alternatives using opportunity cost: compute the profit from producing, subtract the fixed cost of the owned resource from the rental offer, and compare the two on the same basis. A model answer will state the decision rule in a sentence. Students will also write one sentence saying why the $40.91 shutdown price uses average variable cost and the $81.88 breakeven uses average total cost. The target for the next AGBE 341 assessment of PLO 4 is for at least 85% of sampled students to score 3 or higher.**

## Section 7. How We Responded.

j) Describe how “What Was Learned” was communicated to the department, or program faculty. How did faculty discussions re-imagine new ways program assessment might contribute to

program growth/improvement/innovation beyond the bare minimum of achieving program learning objectives through assessment activities conducted at the course level?

The RIC communicated the results of the assessment to all faculty. The instructors of AGBE 321 and AGBE 341 were emailed the results separately.

k) How are the results of this assessment informing changes to enhance student learning in the program?

Instructors of quantitative AGBE courses are incorporating the assessment findings into their courses by increasing attention to fostering students' ability to synthesize and interpret advanced economic derivations. They have increased their efforts in targeted feedback and in-class review, and increased emphasis on evaluation and interpretation.
The AGBE 321 and 341 results met both thresholds (90.5% and 81% of students at 3 or higher). AGBE 341 instructors will add a short practice item and model answer on choosing between producing and renting (including the cost of the owned pasture), and a one-sentence question distinguishing average variable cost from average total cost, before Lab Exercise 6 (see Section 6i). AGBE 321 instructors will add a short worked item on the July offsetting trade and a prompt asking students to state the hedging loss and the difference between reducing variability and maximizing profit when they answer the final part of the hedging problem.

l) If information outside of this assessment is informing programmatic changes, please describe that.

DAEE exit interviews are in-person interviews offered to graduating DAEE majors each semester by the chair of the Resident Instruction Committee and DAEE Student Success Coordinator. In AY 2025-26, 6 graduates took part. Students are asked about the most and least useful classes in the ECNS curriculum and in the CORE, in overall terms, as well as with respect to writing, communication, and math skills. Students asked what skills they wish they were better trained in, and what courses or topics they with the DAEE offered that it does not currently offer. The Student Success Coordinator then groups the answers by theme and reports them to the RIC and to the faculty. This year, **s**tudent exit interviews indicated that AGBE 341 (one of the courses evaluated here) is one of the top courses that AGBE students report as "most beneficial." Another student described the course like this, "Really enjoyed this class mainly because of the curriculum ... used. Many things could be taken and applied to the real world."

m) What support and resources (e.g., workshops, training, etc.) might you need to make these adjustments?

One month summer salary for each DAEE faculty member to participate in teaching workshops, curriculum development, and plans for 7-year review.

## Section 8. Closing the Loop(s).

Reflect on the program learning outcomes, how they were assessed in the previous cycle (refer to #1 of the report), and what was learned in this cycle about any actions stemming from the previous cycle.

a) Self-Reporting Metric (required answer): Based on the findings and/or faculty input, will there be any changes made (such as plans for measurable improvements, realignment of learning outcomes, curricular changes, etc.) in preparation for upcoming assessments?

**Yes** **X** **No** ☐

b) In reviewing the last report that assessed the PLO(s) in this assessment cycle, what changes proposed were implemented and will be measured in future assessment reports? What action will be taken to improve student learning objectives going forward?

The AY 2024-25 assessment found that all students could improve their graphing and their ability to explain what a graph shows. The program is taking these steps.
1. Assignments in AGBE 210, ECNS 204 and AGBE 341 that ask for a graph also require a one- or two-sentence written interpretation, graded separately.
2. The RIC will add a graphing row to the rubric and report the share of students at competent or above in when this PLO is next evaluated.

c) Have you seen a change in student learning based on other program adjustments made in the past? Please describe the adjustments made and subsequent changes in student learning.

**No opportunity to observe yet.**

d) If the program sees anything emerging from this assessment cycle that it anticipates would be a factor or an item of discussion in its 7-year program review cycle, please use this space to document that for future reference.

None

Submit report to programassessment@montana.edu
Update Department program assessment report website.
Update PLO language in CIM if needed (Map PLOs to Course LOs)

## Appendix A. Scoring summary and rationales (PLO 4)

Scored by one rater (Claude) on the 1-4 rubric in Section 5f. Competency threshold = 3 or higher. A score of 4 required no mistakes or gaps. A wrong final decision (AGBE 341 question 8) was scored 2. Student numbers are assigned alphabetically within each course.

### AGBE 321, Lab Exercise 6 question 3 (all 42 students, anonymized)

| Student | Score | Rationale |
|---|---|---|
| 321-01 | 3 | Correct 3a-3d (naturally long, short futures, futures payoff 7.50-P, table, graph). 3e explains hedging reduces variability and notes hedging loss at high prices. Gap: does not state the July offsetting trade. |
| 321-02 | 3 | Correct classification, table (-0.50/1.50/3.25; 2/0/-1.75; total 1.50), graph and July buy-back. 3e names assured margin and lost upside but is brief; futures equation not written as a function of price. |
| 321-03 | 3 | Correct long position, short hedge and July buy-back; table computed for all three prices (total 1.50); graph drawn. 3e is thin ('guaranteed profit') with no hedging-loss or variability discussion; futures equation shown only numerically. |
| 321-04 | 2 | Correct position and short hedge, but the table shows only the $5.50 case and the graph is incorrect. 3e correctly says hedging does not maximize profit but reduces variability, with no price-by-price comparison. |
| 321-05 | 3 | Correct classification, equations, table (sign dropped on -1.75 at $9.25) and graph. 3e: reduces variability, limits boom and bust, covers low and high prices briefly. Gaps: July offset not stated; hedging loss not named. |
| 321-06 | 2 | Correct long classification, short hedge and sell-May/buy-July logic; only the $5.50 case worked in the table, and the graph is incorrect. 3e correctly says hedging reduces variability rather than maximizing profit, but it is brief and not tied to price scenarios. |
| 321-07 | 4 | Complete and correct: long position, short hedge with July buy-back, futures payoff 7.50-P, results at each price, correct graph, and a full 3e covering low-price offset, hedging loss at $9.25, and that hedging reduces variability but does not maximize profit. |
| 321-08 | 4 | Complete and correct: position, short hedge with July offset, futures payoff equation, full table, correct graph, and 3e describing losses/gains in each market at low and high prices and concluding hedging reduces variability. |
| 321-09 | 3 | Correct classification, equations and July offset (sell wheat, buy back futures); correct graph. Gap: gives only the $1.50 total per bushel and not the local and futures profits at each July price; 3e is brief but says hedging reduces variability, not maximizes profit. |
| 321-10 | 1 | Correctly names the long position, short hedge and July sale, but the submission contains no table, graph or discussion for question 3c-3e (the scan has Q3 parts a-b only; later pages cover Q4). Rule stated, not applied or evaluated. |
| 321-11 | 3 | Correct classification, full table (all three prices, total 1.50) and correct graph; short hedge with July offset. Gap: futures profit written only numerically and 3e is a single phrase ('benefits from lower price variability') with no low/high price comparison. |
| 321-12 | 4 | Complete and correct: seller/long, short July futures at $7.50 with July buy-back, futures payoff 7.5-P, full table, correct graphs, and 3e covering low-price offset, lost upside at high prices, and variability reduction rather than profit maximization. |

| | | |
|---|---|---|
| 321-13 | 3 | Correct long/short classification, futures equation, July buy-back, full table and a brief 3e (profit equal, hedging reduces variability). Mistake: the graph has the local and futures lines reversed. |
| 321-14 | 3 | Correct classification, table (all three prices), graph and a clear 3e covering low-price offset, high-price loss and reduced variability; July buy-back stated. Mistake: the futures profit equation in 3b is mislabeled and mixed up with the local equation. |
| 321-15 | 3 | Correct classification, equations, table and July buy-back; 3e is concise but covers bad times, good times and reduced variability. Gaps: graph omits the futures line and the futures sign at $9.25 is unclear. |
| 321-16 | 3 | Correct classification, equations, table and graph; July buy-back stated; 3e explains offset at low prices and stable profit. Gaps: no high-price/hedging-loss discussion, 'short run' used for 'short position', and the futures sign at $9.25 is wrong. |
| 321-17 | 3 | Correct classification, table, graph and a good 3e covering hedging losses at high prices and offset at low prices. Mistake: says to sell a futures contract in July to offset (should buy back). |
| 321-18 | 4 | Complete and correct: classification, equations, offsetting July trade, table, graph with local/futures/total lines, and 3e explains reduced variability, losses on the futures side at high prices, and that profit is not maximized. |
| 321-19 | 3 | Correct long/short logic, equations, complete table showing a constant $1.50 and a sound 3e on offsetting losses and gains. Gaps: messy work, no graph found, and 3e is somewhat muddled on why a profit results. |
| 321-20 | 4 | Complete and correct: classification, equations, offsetting July buy-back, table with constant $1.50, graph, and 3e covers gains/losses in both markets at low and high prices and states the goal is stabilizing profit, not maximizing it. |
| 321-21 | 3 | Correct classification, equations, table and graph; 3e notes guaranteed price and reduced variability, and that the short covers losses when prices fall and local profit covers futures losses when prices rise. Gaps: arithmetic slips in the futures row, and the discussion is brief. |
| 321-22 | 3 | Table, July buy-back and 3e are strong (low prices, high prices, reduced risk but forgone gains). Errors: says producer benefits when prices fall, calls the offsetting position 'naturally short' in 3b, and the graph is sketchy. |
| 321-23 | 4 | Correct classification, equations, July offsetting trade, table with constant $1.50, graph, and 3e covers cash loss offset at low prices, hedging losses at high prices, and variability reduction rather than profit maximization. |
| 321-24 | 3 | Correct classification, equations, July long offset, complete table and graph with local, futures and total lines. Gaps: sign slip on the futures $9.25 entry, and 3e is brief (stability; losses in one market offset by gains in the other) without explicit hedging-loss discussion. |
| 321-25 | 3 | Correct classification, equation, July buy-back, table with constant $1.50 and a strong 3e (low-price offset, forfeited upside as hedging cost, reduces variability not maximum profit). Gap: no graph for 3d. |
| 321-26 | 4 | Complete and correct: classification, equations, July long offset, table, graph, and 3e explains stabilizing prices, protection from large drops, offsetting losses on the short futures position at high prices (hedging losses) and reduced profit variability. |
| 321-27 | 3 | Correct classification, equations, full table and graph. Gaps: no explanation of the July offsetting trade and a very brief 3e (reduces variability; farmer faces futures losses if prices rise) with no low-price discussion. |

| | | |
|---|---|---|
| 321-28 | 3 | Correct classification, equations, table and graph with local, futures and total lines; 3e states hedging reduces variability and describes offsetting gains and losses. Gaps: 3e wording is garbled at points and the July trade is described as buying 'in hopes of a lower price'. |
| 321-29 | 3 | Correct classification, equations, table, graph and a strong 3e (guaranteed profit in bad markets, forgone upside, offsetting movements, reduced variability). Error: says to sell the futures contract before expiry rather than buy it back. |
| 321-30 | 3 | Correct long position, short offset and July repurchase, and a reasonable 3e (gains and losses offset at low and high prices, reduces variability). Gaps: the 3c calculation is shown for only one price, the photo is faint, and the graph is rough. |
| 321-31 | 3 | Correct classification, equations, table and graph; 3e describes losses and gains in both markets at low and high prices and concludes hedging reduces variability. Gap: the July step is muddled ('go long (sell another contract)'). |
| 321-32 | 4 | Complete and correct: classification, equations, July buy-back, full table, graph with all three lines, and a thorough 3e covering low-price protection, the hedging loss at high prices, and that hedging reduces variability rather than maximizing profit. |
| 321-33 | 3 | Correct short offset, July buy-back, equations, table and graph; 3e covers good and bad times and variability reduction in brief. Gaps: 3e is short and does not name hedging losses or the profit-maximization point. |
| 321-34 | 3 | Correct classification, equations, July buy-back, table and graph; 3e notes cash at bad times, cost at good times and reduced variability. Gaps: 3e is brief and does not name hedging losses or state that hedging does not maximize profit. |
| 321-35 | 3 | Correct short position, equations, full table and graph; 3e covers low-price offset, a cost when prices are high and reduced variability. Errors: 3a says the producer benefits when 'the cost rises' instead of when price rises, and 3e wording on buying futures is unclear. |
| 321-36 | 4 | Complete and correct: classification, equations, July offset, table, graph, and 3e explains stable prices, losses locally and gains in futures at low prices and the reverse at high prices, and that the goal is to keep producers from losing money, not maximize profit. |
| 321-37 | 4 | Complete and correct: classification, equations, July buy-back, table, graph, and 3e explains offsetting gains and losses at low prices, hedging losses at high prices, and that hedging reduces variability rather than maximizing profit. |
| 321-38 | 4 | Complete and correct: long position, short futures offset with July buy-back, table with constant $1.50, graph, and 3e explains certainty of margin, the short futures loss when price rises (offsetting higher cash revenue), and that hedging reduces variability rather than maximizing profit. |
| 321-39 | 3 | Correct classification, equations, table, graph and a strong 3e (guaranteed $1.50, gains/losses by price level, does not maximize profit). Gap: the July step is described as delivering on the futures contract rather than buying back the position. |
| 321-40 | 3 | Correct equations, full table and graph; 3e names the protection benefit at low prices, the hedging cost at high prices, and that hedging reduces variability rather than maximizing profit. Gaps: 3a/3b do not clearly state the long/short positions and the July offsetting trade is omitted. |
| 321-41 | 3 | Correct classification, equations, July offset by a long position, table and rough graph; 3e correctly notes that hedging protects profit and stops losses but is thin (no hedging-loss or variability language beyond a sentence). |

| | | |
|---|---|---|
| 321-42 | 2 | Identifies a long position and a short futures position and gets the table totals and graph shape right, but the July step is muddled ('take short in July'), the payoff equations are not stated clearly, and 3e ('always runs a slight profit... can do both') does not explain the tradeoff or variability reduction. |

## AGBE 341, Lab Exercise 6 Part I (all 42 students, anonymized)

| Student | Score | Rationale |
|---|---|---|
| 341-01 | 3 | Q2-Q9 correct (175/$5,110; 200/$10,248; 125/-$12,860; 75/-$19,010; $40.91; $132.36; produce $6,682.50 vs rent $5,000; $81.88) with the rent-versus-produce comparison made. Gap: Q1 reason is circular ('they only exist in the short run') rather than naming the fixed pasture. |
| 341-02 | 3 | Short-run reason (fixed costs), correct optimal herd sizes at all prices, correct shutdown price, correct rent-versus-produce comparison and $81.9 breakeven. Gaps: Q5 loss recorded as -$14,010 (arithmetic error) and Q7 given as 132.5. |
| 341-03 | 4 | All answers correct with work shown: short run because $20,000 fixed costs (none in the long run), 175/200/125/75 cows with correct profits/losses, $40.91 shutdown, $132.35, produce ($6,682.50 vs $5,000, $1,682.50 better) and $81.88 breakeven. |
| 341-04 | 3 | Correct short-run reason, optimal herds and profits (Q5 arithmetic slip: -$19,100), shutdown at $40.9 (lowest AVC), $132.35, produce-versus-rent comparison, and $81.88. Gap: Q9 attributed to covering 'AFC' rather than average total cost; Q8 explanation minimal. |
| 341-05 | 4 | All answers correct with reasoning: short run due to fixed costs; MC-based herd choices (175/200/125/75) and profits; exit below the lowest AVC ($40.91); $132.35; produce ($6,682.50 > $5,000); breakeven $81.88 where ATC is covered. |
| 341-06 | 4 | All answers correct with work shown: short run (fixed costs), 175/200/125/75 cows with correct profits/losses, idle below $40.91, $132.35, produce ($6,682.50 > $5,000 rent) and $81.88 breakeven. |
| 341-07 | 3 | Correct short-run reasoning (fixed costs and fixed pasture), herd sizes and profits, shutdown below about $40 because AVC would not be covered, $133, and produce-versus-rent comparison. Gap: Q9 breakeven of $81.88 attributed to covering 'AFC' rather than average total cost. |
| 341-08 | 4 | All answers correct with work shown: short run because of fixed costs, correct herd sizes and profits/losses, $40.91 as lowest AVC, $132.35, raise beef because profit is higher than renting, $81.88/cwt. |
| 341-09 | 3 | Strong Q1 (fixed pasture, definition of short run), Q2, Q3, Q6-Q9 correct with clear profit-versus-rent comparison. Mistakes: for $60 and $45 the answer states 'optimum # of cows: 0' even though price exceeds AVC, which contradicts the 125 and 75 cow results; Q5 loss given as -$14,010. |
| 341-10 | 2 | Short-run reasoning, optimum herds (175/200/125/75), $133, produce-versus-rent comparison and $81.88 are correct, but the profit/loss figures for $98, $60 and $45 ($4,840; -$19,960; -$26,750) are wrong and the shutdown price is given as $38 instead of $40.91. |
| 341-11 | 3 | Correct short-run reasoning, herd sizes and profits/losses, $132.35 and $81.88 breakeven (with the idea of comparing long-run ATC), and the right decision to raise beef. Gaps: Q6 phrased as marginal revenue below $40.91 and Q8 compares beef revenue ($58,182.50) with rent ($25,000) rather than profit ($6,682.50 vs $5,000). |

| | | |
|---|---|---|
| 341-12 | 1 | Correctly says short run because some resources are fixed, but the optimum herd sizes and profits are wrong (50 cows at every price, profits of $49.09 etc.), Q7 ($76.92) and Q9 ($89.04) are wrong, and Q8 concludes to rent out the pasture without a profit comparison. Decision rules not applied correctly. |
| 341-13 | 4 | All answers correct with MR > MC reasoning shown for each price; short run because of the fixed pasture cost; lowest AVC $40.91; $132.35; raise beef because profit exceeds rent after the $20,000 fixed cost; $81.88 where ATC is just covered. |
| 341-14 | 2 | Thorough and correct on Q1-Q7 and Q9 (fixed costs explained, MR vs MC, accounting for fixed pasture, $40.90 AVC shutdown, $81.88 average total cost). In Q8 the profit of raising beef ($6,682.50) is correctly computed but is then compared with the $25,000 rental income, so the answer is to rent out the pasture, which is the wrong decision. |
| 341-15 | 3 | Correct short-run reasoning, profits/losses ($5,110; $10,248; -$12,860; -$19,010), $40.91 shutdown price, $132.35, produce-versus-rent comparison, and $81.88. Gap: Q2 states 75 cows rather than 175 (herd size slip) and Q6/Q9 explanations are brief. |
| 341-16 | 3 | Correct short-run reasoning (inputs fixed), optimum herds and profits/losses, $132.35, and the right decision to keep raising cattle ($6,682.50 vs $5,000). Mistakes: Q6 gives $43.27 as the lowest marginal cost rather than the minimum AVC of $40.91, and Q9 does not identify the $81.88 breakeven (says the calculation is the same as the short run). |
| 341-17 | 3 | Correct short run (fixed costs), 175/200/125/75 cows with correct profits and losses, $40.91 shutdown, $132.35, MR=MC reasoning, keep producing ($6,682) and $81.88. Gaps: Q8 gives the profit from producing but does not show the rent comparison ($5,000); explanations are brief. |
| 341-18 | 3 | Correct short run (fixed inputs), herd sizes and profits, $40.91 shutdown price (lowest AVC), $132.35, produce-versus-rent comparison ($6,682.50 vs $5,000), and $81.88 breakeven to cover ATC. Minor slip: Q5 loss recorded as -$19,100. |
| 341-19 | 4 | All answers correct with TR-TC work shown: short run because of fixed costs, 175/200/125/75 cows with correct profits/losses, $40.91, $132.35 (MR=MC), keep producing because $6,682 exceeds the $5,000 rental profit, and $81.88 breakeven. |
| 341-20 | 2 | Correct on 75 cows/-$19,010, $132.35 and the $81.88 minimum ATC (long-run price must exceed ATC), and recommends not renting. But Q1 reasoning is confused, herd sizes and profits are given as ranges or approximations (175-200 hd, 150 hd at $60 with -$12,920), shutdown price is $38.79, and Q8 uses revenue and cost ranges rather than the clean profit comparison. |
| 341-21 | 3 | Correct herd sizes and profits/losses at all four prices, $132.25-$132.35, and a clear rent-versus-produce comparison ($6,682.50 > $5,000, $20,000 is a fixed cost); Q9 identifies $81.88 as the lowest ATC. Gaps: short-run reason is thin ('we have a fixed variable') and Q6 is worded as MR below $40.91 without naming AVC. |
| 341-22 | 4 | All answers correct with work shown: short run (fixed costs), 175/200/125/75 cows with correct profits/losses, $40.91 (don't produce if AVC > price), MR = MC at $132.35, produce beef ($6,682 vs $5,000 rent), and price = lowest ATC = $81.88. |
| 341-23 | 4 | All answers correct with work shown: short run because of fixed cost, correct herd sizes and profits/losses, $40.91, $132.35, produce beef because it earns $1,682.50 more than renting, and $81.88. |
| 341-24 | 4 | Excellent written reasoning: short run because the fixed cost cannot be changed; MC vs MR for each price; fixed costs are sunk so only AVC matters for shutdown ($40.91); MR = MC at $132.35; renting yields $5,000 versus $6,682.50 from producing; and $81.88 is the long-run price needed to cover all costs. |

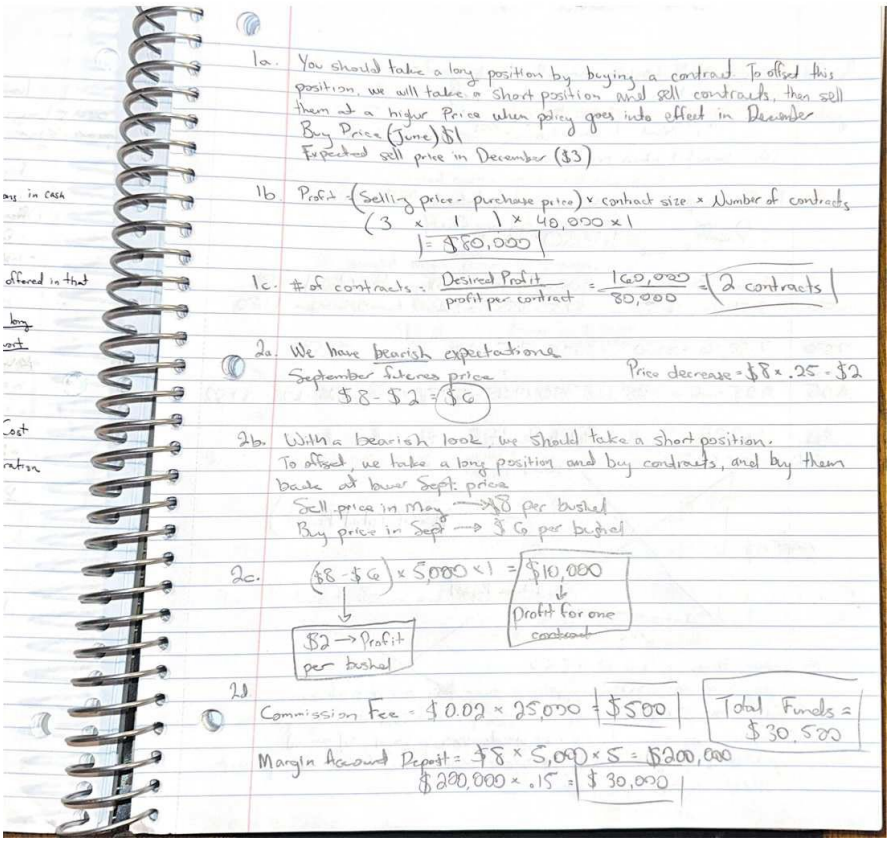
| | | |
|---|---|---|
| 341-25 | 4 | All answers correct with work shown: short run because fixed costs are present (all costs variable in the long run), 175/200/125/75 cows with correct profits/losses, lowest AVC $40.91, $132.35, produce beef for more profit than $5,000 rent, and the lowest ATC $81.88. |
| 341-26 | 3 | Correct herd sizes and profits/losses, AVC shutdown price ($40.91), $132.35, clear produce-versus-rent comparison ($6,682.50 > $5,000) and the $81.88 ATC breakeven. Gap: Q1 states 'in the short run there are no fixed costs (land is fixed)', a misstatement of the reason. |
| 341-27 | 3 | Correct optimum herds and profits/losses at all four prices, $40.91 and $132.25, and the produce-versus-rent comparison ($6,682.50 > $5,000 since $20,000 is fixed). Gaps: thin short-run reason ('we have a fixed variable'), Q6 stated as MR below $40.91, and Q9 explanation of $81.88 is garbled. |
| 341-28 | 2 | Q1-Q7 and Q9 correct with MR>MC notation and the right numbers (175/200/125/75 cows; $40.91; MC = $132.35; $81.88 = minimum ATC), but in Q8 the student computes $6,682.50 for raising beef and then concludes the pasture should be rented out because production profit would be less than renting, which is the wrong decision. |
| 341-29 | 4 | All answers correct and well explained: short run because of fixed land costs, MC=MR at each price, $40.91 because the lowest AVC must be covered, $132.35, produce beef because $6,682.50 > $5,000 rent, and $81.88 where ATC exceeds MC, with ATC=AVC in the long run. |
| 341-30 | 3 | Correct short-run reason, optimum herds, shutdown at about $40.9, $132.5, $81.88, and correct produce-versus-rent decision ($6,682.5 > $5,000). Gaps: Q5 loss recorded as -$14,010, Q9 attributed to covering AVC rather than ATC, and the photographed pages are rotated. |
| 341-31 | 2 | Q1-Q7 and Q9 correct (MR=MC, 175/200/125/75 cows, profits/losses, $40.91 covers AVC, $132.35, $81.88). In Q8 the student computes $6,682.50 for raising beef and $5,000 for renting but answers 'Yes rent pasture', which is the wrong decision. |
| 341-32 | 3 | Strong Q1 (can change herd size but not pasture; fixed costs exist only in the short run), correct herd sizes, TC/TR/profit work, $40.91 lowest AVC, $132.36, correct produce-over-rent comparison ($6,682.50 > $5,000) and $81.88. Mistake: annotates the $60 and $45 cases 'don't produce' even though price exceeds minimum AVC, contradicting the Q6 answer. |
| 341-33 | 3 | Correct herd sizes, shutdown price near $40.91, marginal cost $132.25 and the produce-versus-rent comparison; minor gaps in Q1 reasoning and in the explanation of the $81.88 breakeven. |
| 341-34 | 3 | Correct Q2-Q8 results with MR=MC logic and the right produce-over-rent decision; Q1 and Q9 explanations are brief or loosely worded. |
| 341-35 | 4 | All nine answers correct and clearly explained, including fixed land in the short run, MR=MC herd sizes, $40.91 lowest AVC shutdown, $132.25, produce over rent ($6,630 > $5,000) and $81.88 lowest ATC. |
| 341-36 | 3 | Handwritten notebook answers: Q1 'we have a fixed variable' is vague, but Q2-Q5 are correct, Q6 exit if MR is below lowest AVC $40.91, Q7 $132.25, Q8 raise beef ($6,630 > $5,000 rent) and Q9 $81.88 lowest ATC. |
| 341-37 | 4 | All answers correct and well reasoned: fixed pasture in the short run, MR=MC herd sizes, $40.91 shutdown, $132.25, produce over rent and $81.88 lowest ATC. |

| | | |
|---|---|---|
| 341-38 | 3 | Correct herd sizes, profits and losses, $40.91 and $132.35, and the right produce-over-rent decision ($6,682.50 > $5,000). Gaps: Q1 reason is vague ('fixed variable cost') and Q9 explanation mixes variable-cost and ATC reasoning. |
| 341-39 | 2 | Q1-Q7 and Q9 correct with clear work, but Q8 concludes 'Rent out the pasture' by comparing $25,000 with $6,682.50 and ignoring the $20,000 cost of the pasture, so the profit-maximizing decision is wrong. |
| 341-40 | 4 | All nine answers correct with work shown: fixed costs exist only in the short run, MR>=MC at 175/200/125/75, shutdown at $40.91 because variable costs cannot be covered, $132.35, produce over rent ($6,682.50 vs $5,000) and $81.88. |
| 341-41 | 3 | Photographed upside down. Correct numbers throughout, correct produce-over-rent decision ($6,682.50 vs $25,000-$20,000 = $5,000) and $40.91/$132.35/$81.88; explanations in Q1, Q6 and Q9 are terse. |
| 341-42 | 2 | Correct Q1-Q7 and Q9 (min AVC $40.91, $132.35, $81.88 min ATC), but in Q8 compares $25,000 rent with $6,682.50 profit, ignores the $20,000 land cost and answers 'rent out pasture', the wrong decision. |

# Appendix B. AGBE 321 student submissions (Lab Exercise 6)

Question 3 is the wheat farmer's hedging problem: classify the farmer's natural position, state the futures hedge, work out local, futures, and total results at the July prices of $5.50, $7.50, and $9.25, graph them, and discuss hedging in 3e. Pages are as submitted, anonymized; the top margin of each page has been blanked to remove any name. Some submissions include pages for other lab questions.

## Student 321-01 (score 3)



1a. You should take a long position by buying a contract. To offset this position, we will take a short position and sell contracts, then sell them at a higher Price when policy goes into effect in December
Buy Price (June) $1
Expected sell price in December ($3)

1b Profit = (Selling price - purchase price) × contract size × Number of contracts
(3 × 1) × 40,000 × 1
= $80,000

1c. # of contracts = Desired Profit / profit per contract = 160,000 / 80,000 = 2 contracts

2a. We have bearish expectations
September futures price
$8 - $2 = $6
Price decrease = $8 × .25 = $2

2b. With a bearish look, we should take a short position.
To offset, we take a long position and buy contracts, and buy them back at lower Sept. price
Sell price in May → $8 per bushel
Buy price in Sept → $6 per bushel

2c. ($8 - $6) × 5000 × 1 = $10,000
$2 → Profit per bushel
$10,000 → Profit for one contract

2d
Commission Fee - $0.02 × 25000 = $500
Total Funds = $30,500
Margin Account Deposit = $8 × 5,000 × 5 = $200,000
$200,000 × .15 = $30,000

# Lab Excercise #6

3a. Being a producer, we are naturally long.
Profit Equation:

$$Payoff_{local} = P^{expiration}_{local} - Cost$$

We benefit when prices rise

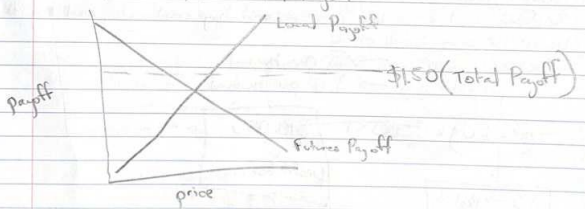
3b. To offset a price drop risk, we need to take a short position.

$$Payoff_{futures} = \$7.50 - P^{expiration}_{Futures}$$

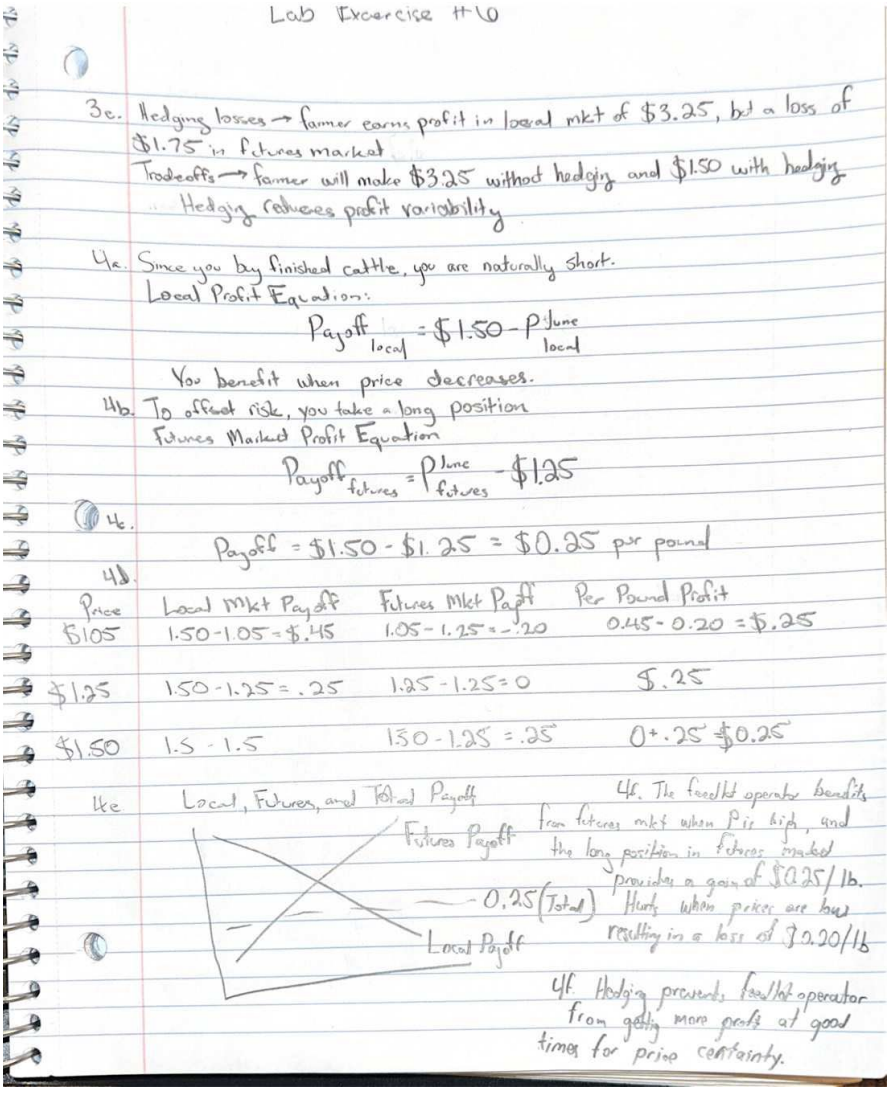
3c.

| | Local mkt Payoff | Futures mkt Payoff | Per Bushel Profits |
|---|---|---|---|
| 5.50 | 5.50-6 = $-.50 | $7.5 - $5.5 = $2 | -0.5 + 2 = $1.50 |
| 7.50 | 7.50 - 6 = $1.50 | $7.5 - 8.5 = $0 | $1.50 |
| 9.25 | 9.25 - 6 = 3.25 | 7.50 - 9.25 = -1.75 | 3.25 - 1.75 = $1.50 |

3d. Local, Futures, and Total Payoff




3e. When Prices are low at $5.50
Local: loss of $.50, selling price is lower than cost of production
Futures: $7.50 - $5.50, Farmer gains profit of $2 from short position
Overall: The gain in futures mkt offsets loss in Local, w/ overall profit of $1.50 per bushel. The farmer benefits how futures mkts protect producers from price risk.



Lab Exercise #10

3c. Hedging losses → farmer earns profit in local mkt of $3.25, but a loss of $1.75 in futures market
Tradeoffs → farmer will make $3.25 without hedging and $1.50 with hedging
Hedging reduces profit variability

4a. Since you buy finished cattle, you are naturally short.
Local Profit Equation:

$$Payoff_{local} = \$1.50 - P^{June}_{local}$$

You benefit when price decreases.

4b. To offset risk, you take a long position
Futures Market Profit Equation

$$Payoff_{futures} = P^{June}_{futures} - \$1.25$$

4c.

$$Payoff = \$1.50 - \$1.25 = \$0.25 \text{ per pound}$$

4d.

| Price | Local Mkt Payoff | Futures Mkt Payoff | Per Pound Profit |
|---|---|---|---|
| $1.05 | 1.50 - 1.05 = $.45 | 1.05 - 1.25 = -.20 | 0.45 - 0.20 = $.25 |
| $1.25 | 1.50 - 1.25 = .25 | 1.25 - 1.25 = 0 | $.25 |
| $1.50 | 1.5 - 1.5 | 1.50 - 1.25 = .25 | 0 + .25 $0.25 |

4e. Local, Futures, and Total Payoff



4f. The feedlot operator benefits from futures mkt when P is high, and the long position in futures market provides a gain of $0.25/lb. Hurts when prices are low resulting in a loss of $0.20/lb

4f. Hedging prevents feedlot operator from getting more profit at good times for price certainty.

**Student 321-02 (score 3)**

1) June Price = $1.00/lb
Expected increase = + $2.00/cwt
Contract size = 40,000 lbs

2) Should take long position since we expect Price to increase so we will offset the position by buying contracts now and then selling them in the future

b) Profit per Pound will be $2.00
40,000 lbs x $2.00 = $80,000 Profit for one contract

c) $160,000 / $80,000 = 2 contracts

2) 5,000 bushels MAY Price = $2.00 / bu
expected Price = $8.00 * 0.25 = $2

a) Bearish Price expectation. If correct future price will be $6

b) I will take a Short Position. To offset I will sell the current contracts at $8 And buy them in the future at $6

c) Profit will be $2.00 Per bushel
5,000 x $2 = $10,000 will be my Profit per contract

d) 5,000 x 5 = 25,000 X 0.02 = $500 commission
25,000 x $8 = 200 000 x 0.15 = $30,000 deposit
$30,500 will have to be deposit by MAY

cost

2) I'm naturally long Position in the market

$\Pi_{local} = P_{July} = \$6$

I Benefit with Rise in Prices

b) I would Hedge by taking a Short Position

$\Pi_{profit} = \$7.50 - \$6.00 = \$1.50$ Profit P/bu

In July you buy back the contract and sell the wheat

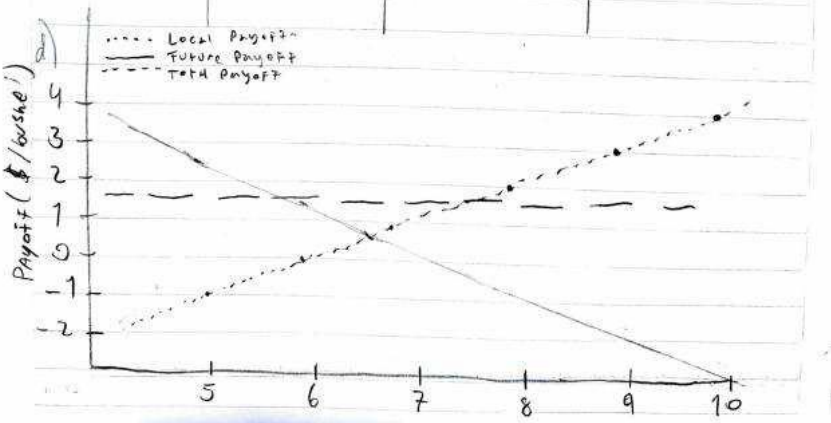
c) $P_{Total} = (P^{Position}_{Local} - Cost) + (P^{New}_{Futures} - P^{Expiration}_{Futures})$

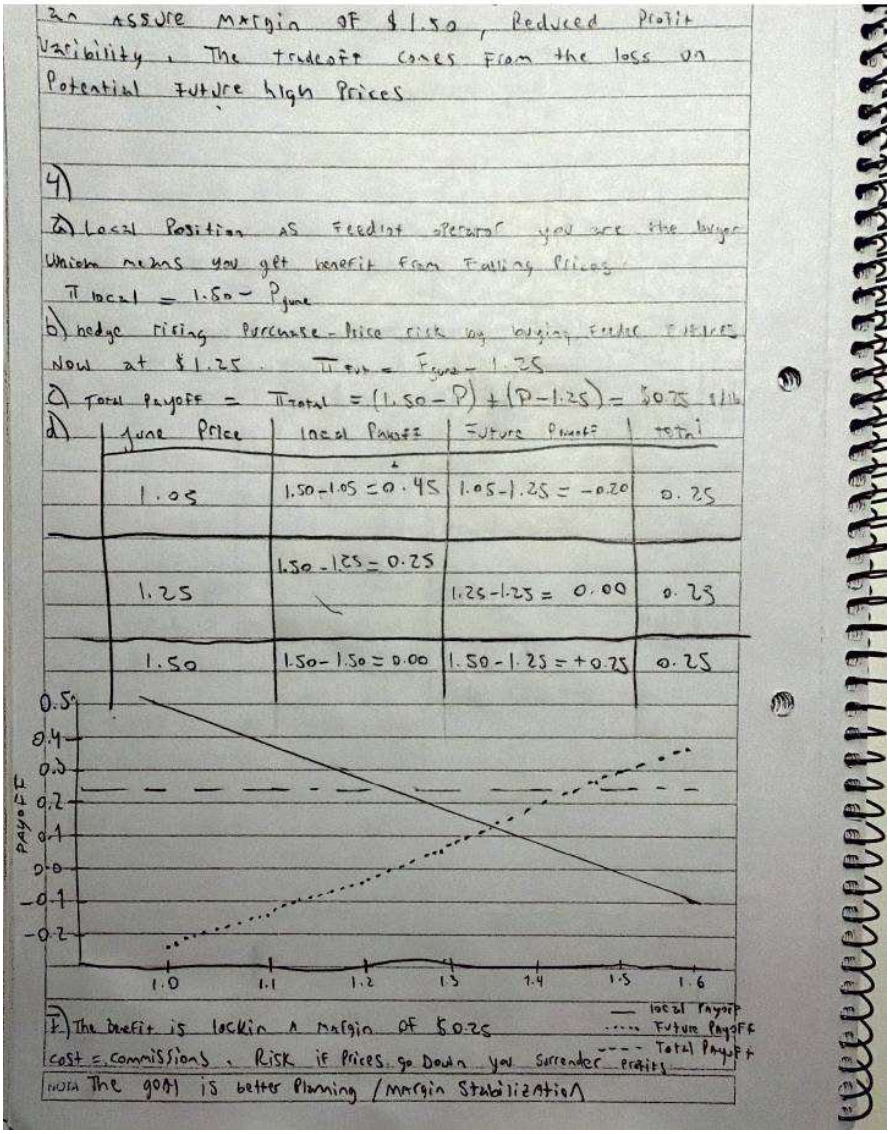
($5.50/$7.50/$9.25 − $6 + $7.50 − 5.50/7.50/9.25

$2 / $1.5 / $1.75

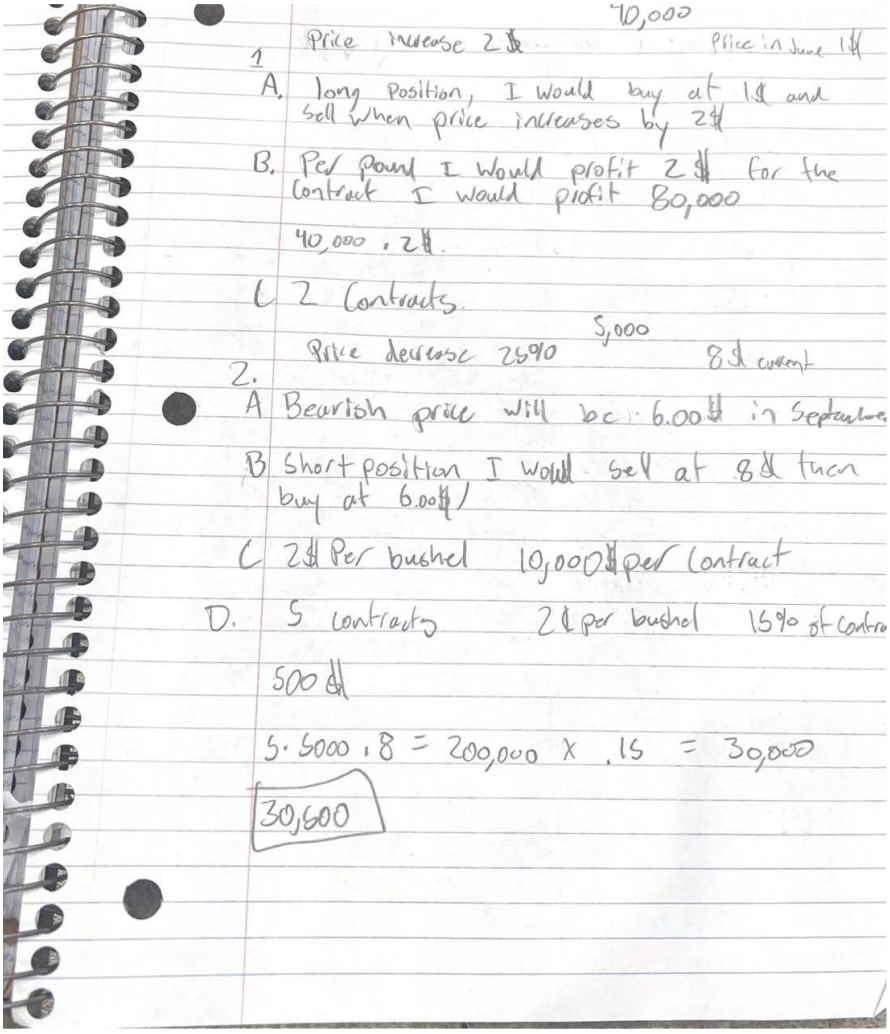
| Price in July | Local Payoff | Futures Payoff | total |
|---|---|---|---|
| 5.50 | 5.50 − 6 = −0.50 | 7.50 − 5.50 = +2.00 | 1.50 |
| 7.50 | 7.50 − 6 = +1.50 | 7.50 − 7.50 = $0.00 | 1.50 |
| 9.25 | 9.25 − 6 = +3.25 | 7.50 − 9.25 = −1.75 | 1.50 |

d)






**Student 321-03 (score 3)**



70,000

Price increase 2¢ Price in June 1¢

1

A. long position, I would buy at 1¢ and sell when price increases by 2¢

B. Per pound I would profit 2¢ for the contract I would profit 80,000

40,000 . 2¢.

C 2 Contracts.

5,000

Price decrease 25% 8¢ current

2.

A Bearish price will be 6.00¢ in September

B Short position I would sell at 8¢ then buy at 6.00¢/

C 2¢ Per bushel 10,000¢ per contract

D. 5 contracts 2¢ per bushel 15% of contra

500¢

5 . 5000 . 8 = 200,000 X .15 = 30,000

30,600

3. A long position you benefit when price rises.

A Payoff local = $P_{wheat}^{wishlist} - 6.00$

B Short in July I would buy a contract

Payoff futures = $P_{futures}^{now} - P_{futures}^{expiration} = 7.50 - 6 = 1.50$

C $PF_{local} = 7.50 - 6 = 1.50$ per bushel

$PF_{futures} = 7.50 - 7.50 = 0$

= 150 bushel

5.50 - 6 = -0.50

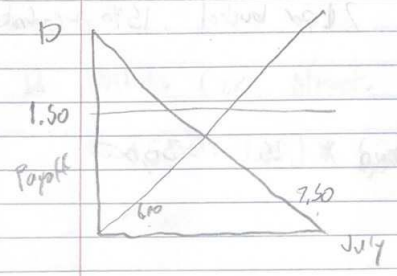
= 1.50

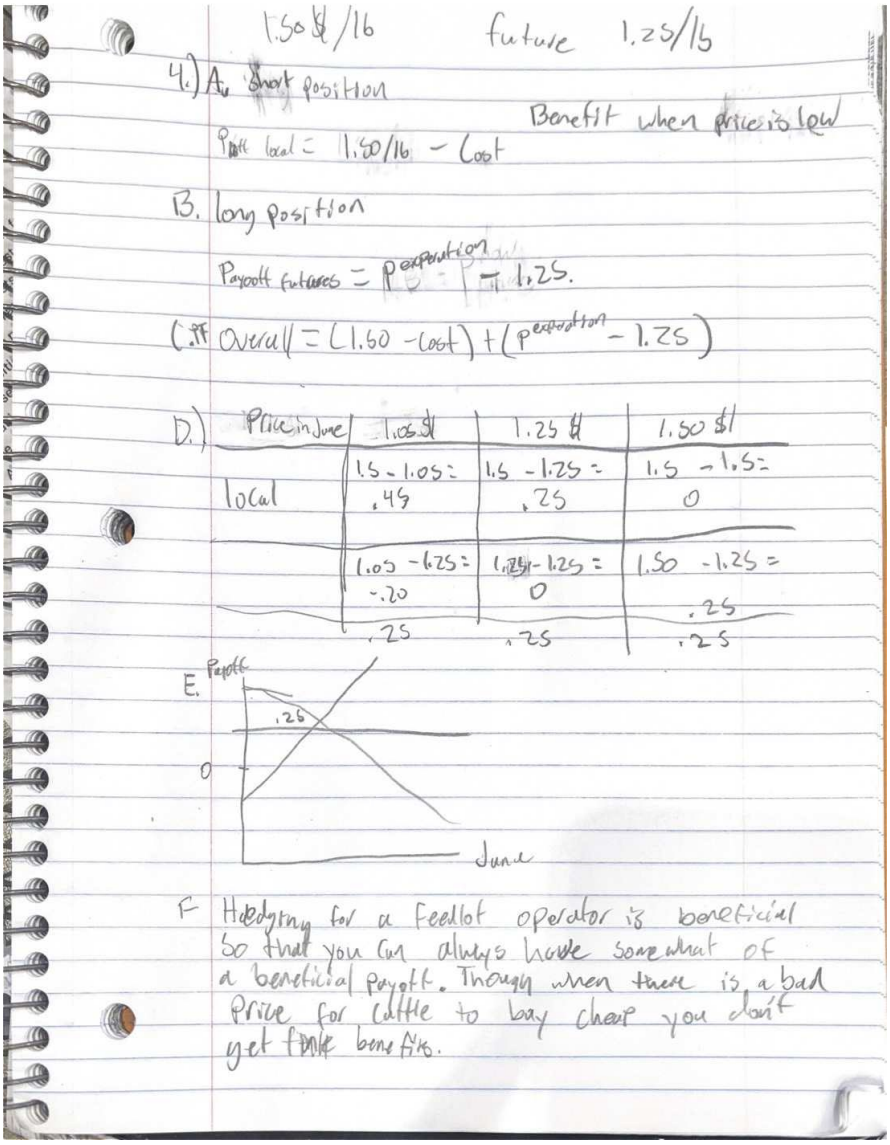
7.50 - 5.50 = 2.00

9.25 - 6 = 3.25 = 1.50

7.50 - 9.25 = -1.75

E) He almost always makes some of a guaranteed profit whether the price increase or decreases below the hedging.






**Student 321-04 (score 2)**

# Lab 6

1. Effect in December, increased price fed cattle by $2. A fed cattle contract is 40,000, price in June is $1.00/lb

A. If you think the price is going to increase you would take a long position. You would buy now at a lower price to sell at the higher future price to get profit. You will buy in June at $1.00/lb and sell in December for $3/lb

B. Profit = (Sell price − purchase price) · 40,000 · 1
= (3−1) · 40,000 · 1
= 2 · 40,000 · 1
= $80,000

80,000 / 40,000
= $2/lb

C. 160,000 = (3−1) · 40,000 · x
160,000 = 2 · 40,000 · x
160,000 = 80,000 · x
2 · x
2 contracts

2. 1. ΔP = 25% C = 5000 Bushels P = $8.00/bushel

A. You would have bearish price expectations because if you believe prices will decrease, if you are correct the prices in September are $6.00

8.00/.75 = 2
8.00 − 2 = 6

B You should take a short position if you believe in the price falling. You should sell now and buy later, which will be lower in September. You will sell now for $8.00 Bushel and the profit made would pay for the new contract bought at 5,000 Bushel

C. Profit = (8-6) · 5000 · 1
= 2 · 5000 · 1
= $10,000

D. Contract Value = (8) · (5,000) · (5)
= 40,000 · 5
= 200,000

Comission fee = .02 · 25000
= $500

3. We are in a naturally long position. You benefit when the price rises in the local Market.

$Payoff_{local} = P^{expiration}_{local} - Cost$

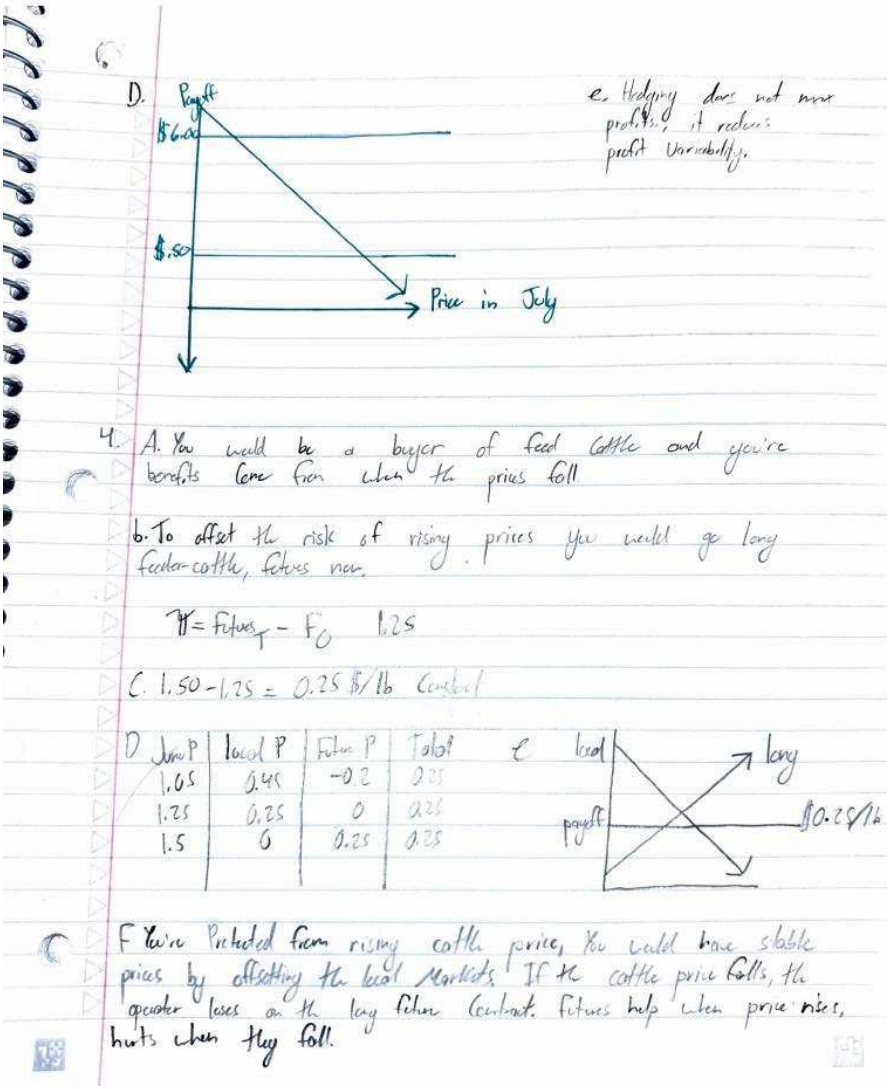
B. You Sell in May and Buy in July happily for a lower price that would offset the Contracts. You would benefit from this because the contract you sold would Cover the costs.

$P_{overall} = (P^{expiration}_{local} - Cost) + (P^{new}_{futures} - P^{expiration}_{futures})$

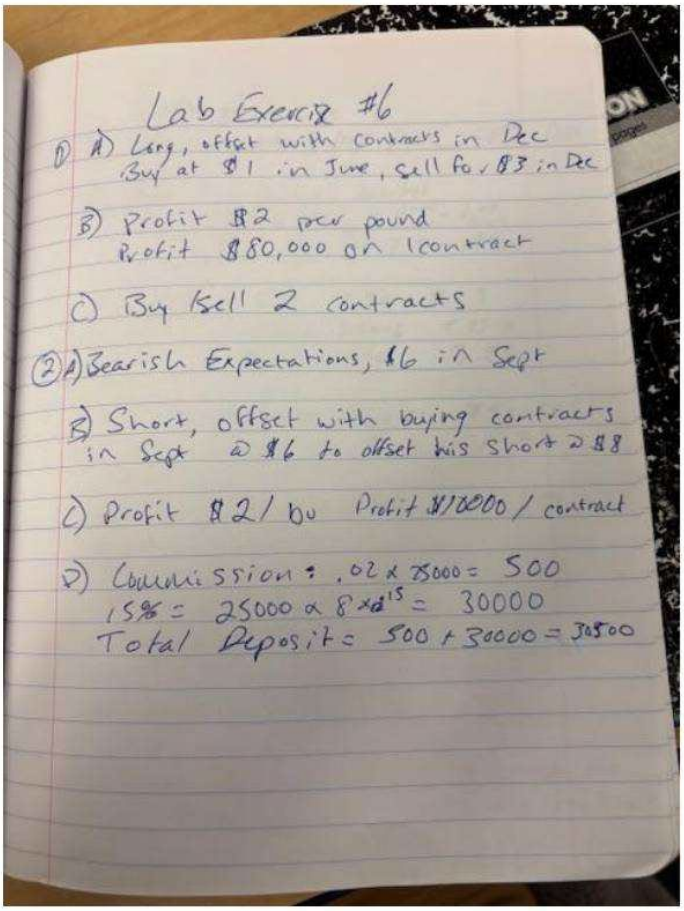
C. Local

(5.50 - 6)
-.50
-.50 + 2.00
$1.50

futures
(7.50 - 5.50)
$2.00




**Student 321-05 (score 3)**



# Lab Exercise #6

1) A) Long, offset with contracts in Dec
Buy at $1 in June, sell for $3 in Dec

B) Profit $2 per pound
Profit $80,000 on 1 contract

C) Buy/Sell 2 contracts

2) A) Bearish Expectations, $6 in Sept

B) Short, offset with buying contracts in Sept @ $6 to offset his short @ $8

C) Profit $2/bu Profit $10000/contract

D) Commission: .02 x 25000 = 500
15% = 25000 x 8 x .15 = 30000
Total Deposit = 500 + 30000 = 30500

# Lab Excercise 6

(3) A) You are naturally long $Payoff_{local} = P_{then}^{exp} - Cost$

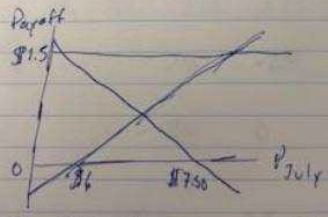
B) Short the futures market

$PF_{local} = P_{local}^{July} - 6$ $PF_{future} = P_{future}^{now} - P_{future}^{exp}$

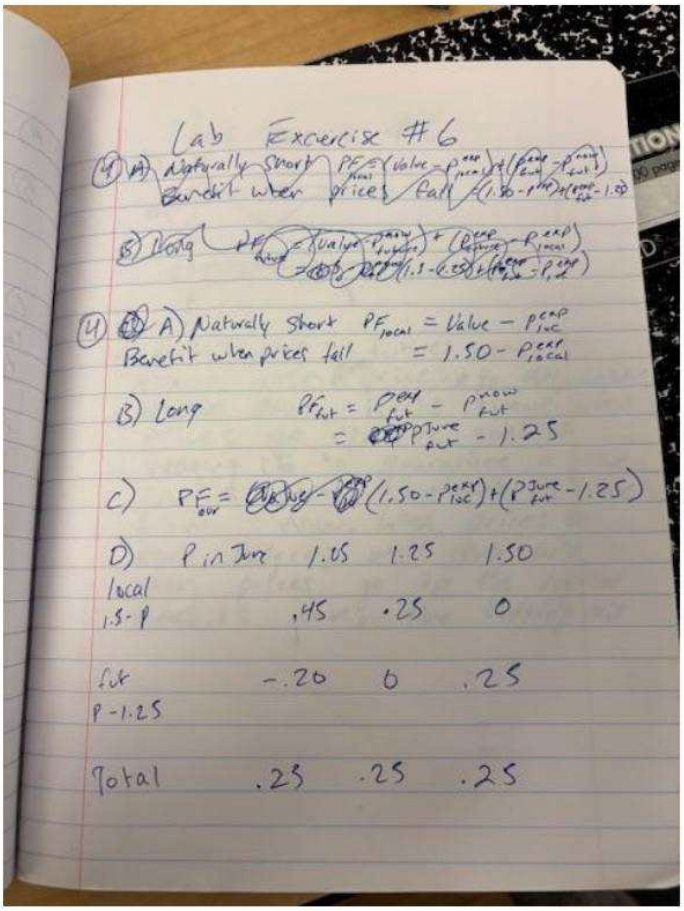
$= 7.5 - P_{future}^{July}$

| C) $P_{in\ July}$ | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| local | 5.50-6 | 7.50-6 | 9.25-6 |
| $P_{July}-6$ | -.50 | 1.50 | 3.25 |
| Future | 7.50-5.50 | 7.50-7.50 | 7.50-9.25 |
| $7.50-P_{July}$ | 2 | 0 | 1.75 |
| Total | 1.50 | 1.50 | 1.50 |

D)




E) Benefits by guaranteeing a price no matter what. When prices decrease, the short covers, when prices increase the local profit covers. Hedging reduces variability, limits boom + bust



Lab Exercise #6

(4) A) Naturally Short $PF_{local} = (Value - P^{exp}_{loc}) + (P^{exp}_{fut} - P^{now}_{fut})$
Benefit when prices fall $(1.50 - P^{exp}_{loc}) + (1.00 - 1.00)$

B) Long $PF_{fut} = (Value - P^{now}_{future}) + (P^{exp}_{future} - P^{exp}_{local})$
$(1.3 - 0.25) + (P^{exp}_{fut} - 1.25)$

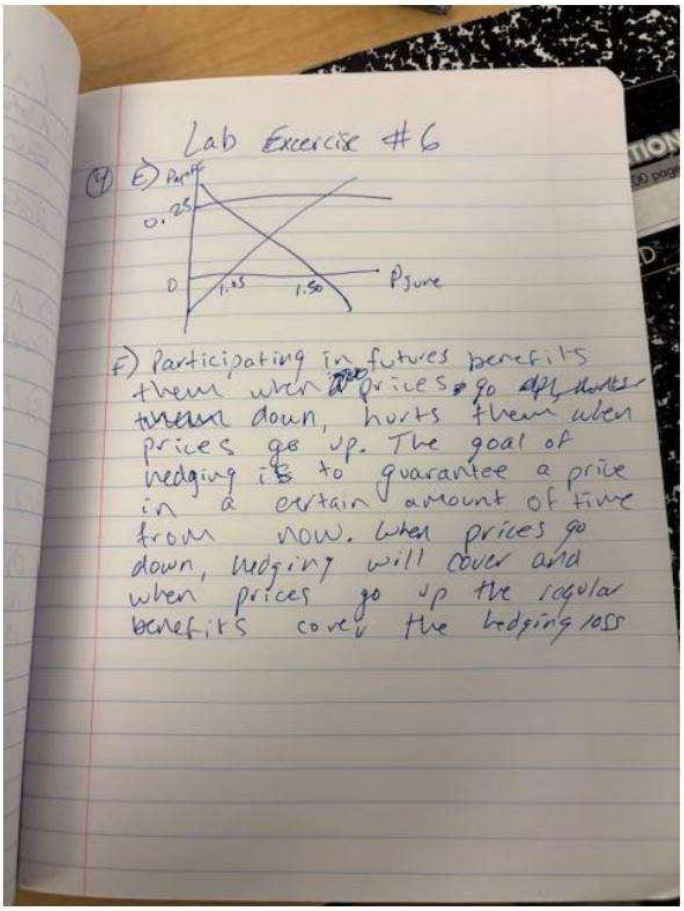
(4) A) Naturally Short $PF_{local} = Value - P^{exp}_{loc}$
Benefit when prices fall $= 1.50 - P^{exp}_{local}$

B) Long $PF_{fut} = P^{exp}_{fut} - P^{now}_{fut}$
$= P^{June}_{fut} - 1.25$

C) $PF_{our} = (1.50 - P^{exp}_{loc}) + (P^{June}_{fut} - 1.25)$

D)

| P in June | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| local 1.5 - P | .45 | .25 | 0 |
| fut P - 1.25 | -.20 | 0 | .25 |
| Total | .25 | .25 | .25 |




**Student 321-06 (score 2)**

for a higher price on the futures market. You'll buy in June at $1 per pound then sell it on the futures market for $3 in December per pound.

b) $\pi$ = (Selling price − purchase price) · 40,000 · 1 → (3 − 1) · 40,000 · 1
→ 2 · 40,000 · 1 = $80,000 → 80,000 / 40,000 = $2 per pound

c) 160,000 = (3 − 1) · 40,000 · X → 160,000 = 80,000 · X → X = 2
→ 2 contracts from equation

2) a) % ΔP = 25% C = 5000 bushels → you would most likely have a bearish price outlook and expectations, expectations to have the price fall, September prices should be $6 → 8.00 / .25 = 2 →
8.00 − 2 = 6

b) You should take a short position if you expect prices to fall, look towards selling now and buying later, most likely later is in September, sell now at $8/bushel the municipal power will pay for the 600 bushel contract

c) Profit = $\pi$ = (8 − 6) · 5000 · 1 → 2 · 5000 · 1 = $10,000

d) Contract value = (8) · (5000) · (5) → 40,000 · 5 = 200,000

3) a) Being in a naturally long position, you can benefit when the price in a local market rises

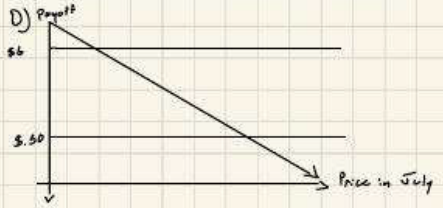
b) Sell in May and buy in July holding out for a better price (lower) that would offset the contracts. You can potentially benefit from this since the contract that was sold would lower the costs

c) $P_f^{overall}$ = ($P_{local}$ − cost $6) + ($P_{futures}^{new}$ − $P_{futures}^{expiration}$)

local → (5.50 − 6) → −0.50 + 2.00 → $1.50

Futures → (7.50 − 5.50) → $2.00

D)




e) Hedging is a risk management strategy, to protect against profit variability, and doesn't maximize profits

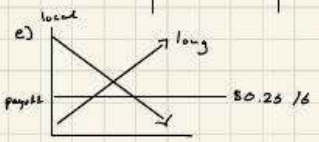
b) To buy and deliver the wish of raising prices you should take a long position for feeder cattle futures now

c) $\pi$ = futures$_T$ $-F_0$ 1.25 → 1.50 − 1.25 = .25 per pound/contract

d)

| June Price | local Price | Future Price | Total |
|---|---|---|---|
| 1.05 | 0.45 | −0.2 | 0.25 |
| 1.25 | 0.25 | 0 | 0.25 |
| 1.5 | 0 | 0.25 | 0.25 |

e)




f) You're protected from prices rising in cattle you could have double profits by speculating on the local markets, if cattle prices fall, then the losses will fall on the long feeder contracts

**Student 321-07 (score 4)**

a.) Because you expect the price to increase, you should take the long position. You would offset this position by taking the short position in June.

You will buy contracts in June for $1.00/lb and sell in December you will sell for $3.00/lb

b.) $\pi = (3-1) \times 40{,}000 \times 1 =$ $80,000 profit for 1 contract

$\frac{80{,}000}{40{,}000} =$ $2.00 profit per pound

c.) You should sell and buy at least 2 contracts in order to make $160,000 profit.

(2)

a.) P ↓ 25%. 1 contract = 5,000 bu May Price = $8.00 bu

You have bearish price expectations. The soybean futures price will be $6.00/bu if the prices decrease by 25%.

b.) You would take the short position because you expect the price to decrease. You will offset this position by taking the long position in September.

You will sell Soybean contracts at $8.00/bu in May, and buy contracts at $6.00/bu in September.

8 - 6 = $2.00

You would profit $2.00/bu if the price decreased by 25¢.

You would profit $10,000 if you trade 1 contract.

d.)

5,000 bu × 5 contracts = 25,000 units

0.02 · 25,000 = $500 Commission fee

5 × 5000 × 8.00 = 200,000

.15 · 200,000 = 30,000

You will deposit $30,500 into the clearing house.

(3)

a.) As a producer, you would be naturally long in the local market, and benefit when prices rise

local Profit eqn. : $Payoff_{local} = P^{July}_{local} - \$6.00$

b.) You would take the short position in the futures market.

$Payoff_{futures} = 7.50^{May}_{July} - P^{July}_{July}$

naturally long = local P ↑

P ↓ futures = more money on short

short in futures in May buy long futures contract in July

short = make money when P ↓

* ignore this ↑

C) Futures Market

Payoff futures = $7.50 $^{may}_{July}$ - 5.50

= $2.00 profit in July price is $5.50

Payoff futures = $7.50 $^{may}_{July}$ - 7.50

= $0.00 profit if July prices were $7.50

Payoff futures = $7.50 $^{may}_{July}$ - $9.25

= -$1.75 profit if July prices were $9.25

local market : $P^{July}_{local}$ - $6.00 $1.50

Payoff local = $5.50 - $6.00 $1.50

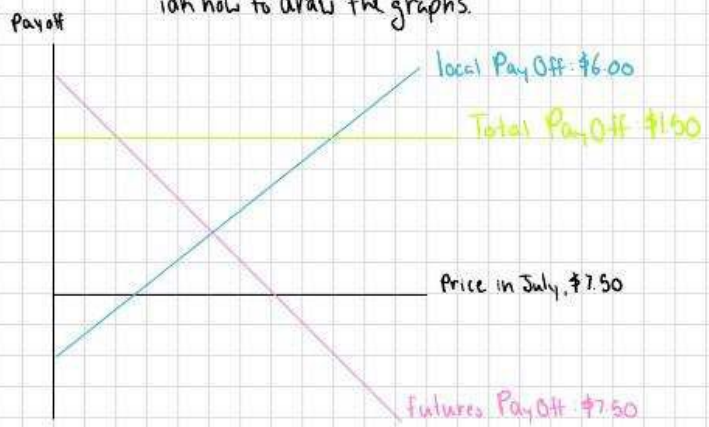
= - $0.50 profit if July price were $5.50

= $1.50 profit if July prices were $7.50

Payoff local = $9.25 - $6.00

= $3.25 profit if July prices were $9.25

d.) idk how to draw the graphs.




e.) The farmer benefits from hedging when prices are low because he is able to minimize his loss in the local market by taking the short position in the futures market. When the price is only $5.50, the payoff in the local market is -$0.50 and the futures payoff is $7.00 Even though there is loss in the local market, the farmer still profits $1.50 as his total payoff due to the higher prices in the futures market.

profit $3.25/cwt. However, because the futures payoff is -$1.75, the farmers total payoff is $1.50. This tradeoff means that the farmer won't make the maximum profit available, however, it also means that the profit loss won't be as large as it could be when prices are low.

Hedging does not maximize profit since the producer will always "lose" in one market while gaining in another market. Instead hedging reduces profit variability. So even though producers won't reach their maximum profit, they also won't lose as much when prices are low.

(4) Sale P = $1.50 Current FP = $1.25

Currently October w/ Fut. P = $1.25

a.) You would take the short position and buy feeder cattle futures at $1.25/lb for June. You would benefit when prices decreases.

$$\text{local payoff}_{\text{local}} = \$1.50 - P^{\text{June}}_{\text{local}}$$

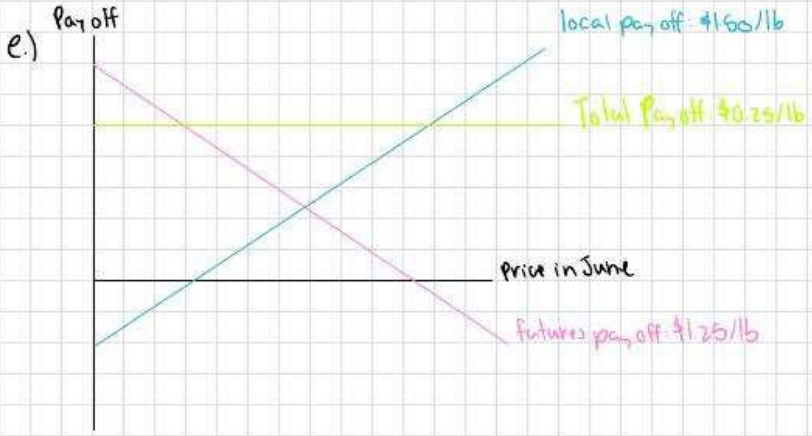
b.) You will take the long position in the futures market

$$\text{payoff}_{\text{futures}} = P^{\text{June}}_{\text{futures}} - \$1.25$$

c.) The total payoff with a hedging strategy would be $0.25/lb

| Price in June | $1.05/lb | $1.25/lb | $1.50/lb |
|---|---|---|---|
| local Market pay off $= 1.50 - P^{June}_{local}$ | 1.50 - 1.05 = $0.45 | 1.50 - 1.25 = $0.25 | 1.50 - 1.50 = $0.00 |
| Futures Market pay off $= P^{June}_{futures} - 1.25$ | 1.05 - 1.25 = - $0.20 | 1.25 - 1.25 = $0.00 | 1.50 - 1.25 = $0.25 |
| Total Per lb $= (1.50 - P^{June}_{local}) + (P^{June}_{futures} - 1.25)$ | $0.25 | $0.25 | $0.25 |

e.)




still don't know how to draw the graphs.

market when prices on futures decrease. However, in the futures markets, the operator loses.

When the operator participates in the futures market, they benefit when the price increase, because they are long in the futures market. When prices are low, they hurt because they profit less, this is once again because they have a long position in the futury market.

The goal of hedging is to minimize price fluctuations in the market for producers. The producer will not reach their maximum profit in the local or futures market (depending on their position) because the 2 markets are always in the opposing positions. This is good however, because this means that producers also won't lose as much as they could. So even if one of the markets is low, the other offsets that loss of profit.

**Student 321-08 (score 4)**

# Lab Exercise 6

1. a.] If you think prices ↑ then go long. Buying at June price of $1/lb. and sell at December price of $3/lb. To offset this position we will buy a short contract as well.

b.] Profit per pound is $2

Total Profit $= (3-1) \cdot 40{,}000 \cdot 1 = 2 \cdot \$40{,}000 =$ $80,000

c.] $\$160{,}000 = (3-1) \cdot 40{,}000 \cdot N$

$\$160{,}000 = 80{,}000 \cdot N$

2 = # of contracts

2. a.] Bearish price expectations

$\$8/lb \cdot 0.75 =$ $6/lb

b.] We will take the short position but the long position to offset. We will sell now at $8 and buy later at $6.

c.]

$\pi = (8-6) \cdot 5{,}000 \cdot 1 = \$10{,}000$

You would profit $2/bushel

d.] $5{,}000 \cdot 5 = 25{,}000 \cdot .02 = 500 \leftarrow$ commision fee

$\approx$ Contract value

Contract value $8 \cdot 25{,}000 = 200{,}000 \cdot 0.15 = 30{,}000$

$30{,}000 + 500 =$ 30,500 deposit

3. a.] Naturally Long: $Payoff_{local} = P^{expiration}_{local} - Cost(\$6)$

Benefit when prices rise

b.] Take short to offset: $Payoff_{futures} = P^{now}_{futures} - P^{expiration}_{futures}$

Variability risk

Take a long position to offset future.

$P_{May} - P_{July}$

$\$7.50 - P_{July}$

c.] Futures: $7.50 − $5.50 = $2

$7.50 − $7.50 = $0

$7.50 − $9.25 = −$1.75

$2 + (−.50) = $1.50

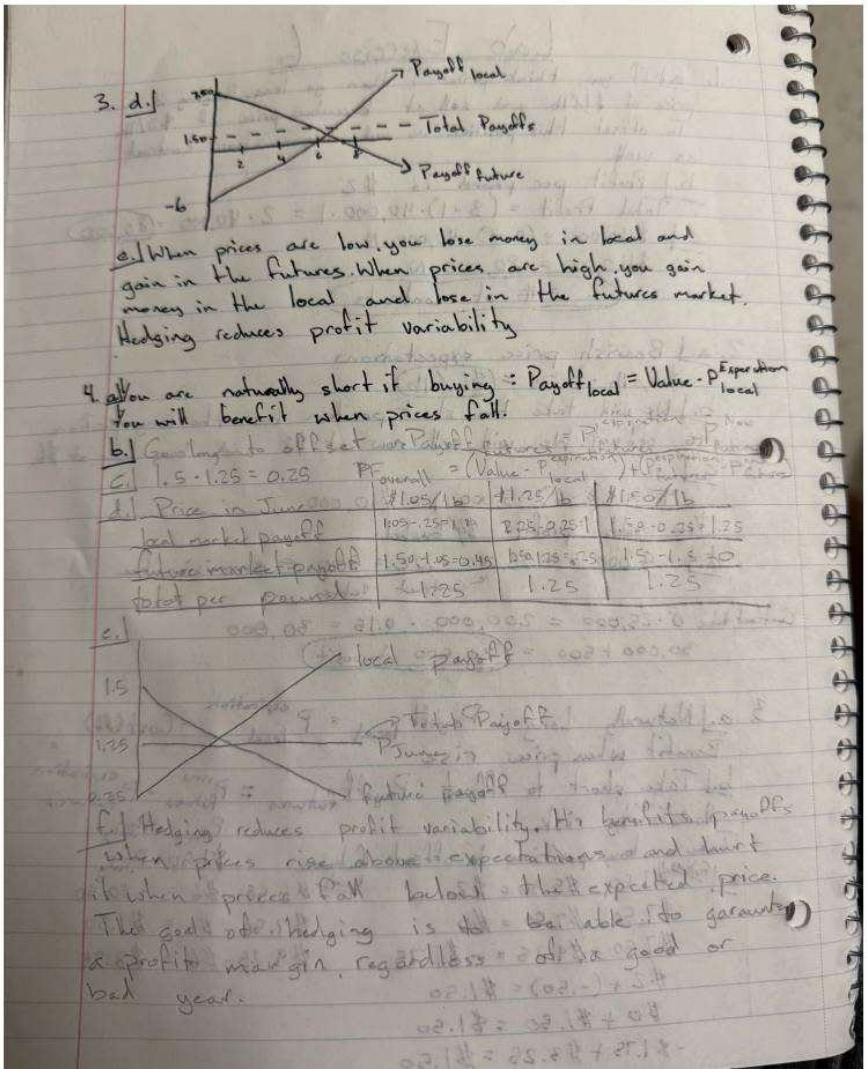
$0 + $1.50 = $1.50

−$1.75 + $3.25 = $1.50

Local: $5.50 − $6 = −$0.50

$7.50 − $6 = $1.50

$9.25 − $6 = $3.25




**Student 321-09 (score 3)**

(1) a) You should take the long position. To offset this position, you should sell a futures contract in December when prices rise.

b) pound: $3.00 - $1.00 = $2.00/lb

contract: $2.00 x 40,000 = $80,000/contract

c) $\frac{160,000}{80,000}$ = 2 contracts

(2) a) Bearish. $8.00 x (1-0.25) = $6.00/bu

b) You should take the short position. To offset this position you should buy futures in September when prices fall.

c) bushel: $8.00 - $6.00 = $2.00/bu
contract: 5,000 x $2.00 = $10,000/contract

d) comission: $.02/bu x 5000bu/contract x 5 contracts
= $500

contract: 5000 x $8 = $40,000
15% = $6,000
5 x $6,000 = $30,000

total due in May: $30,500

③ a) You are long in the local market.

$\Pi_{local} = C_{July} - 6$

You benefit when prices rise.

b) You would take the short position in July.

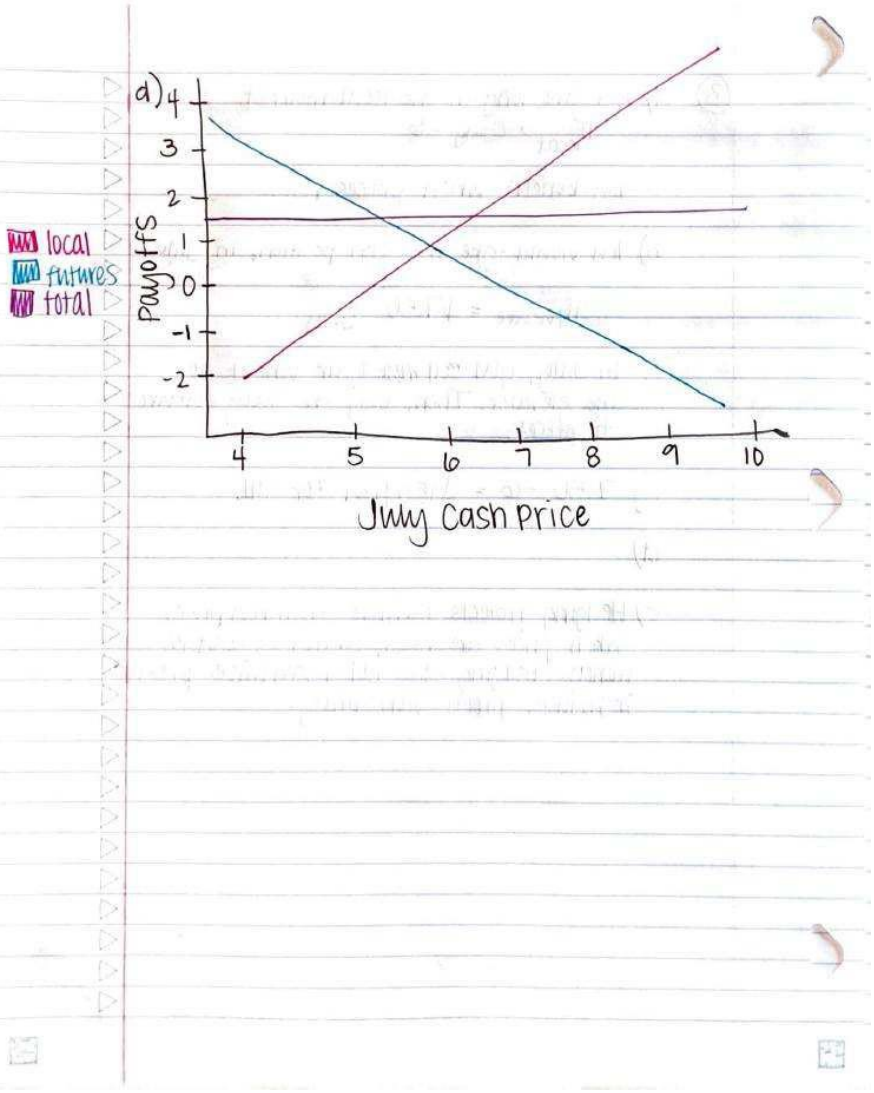
$\Pi_{future} = \$7.50 - F_{July}$

In July, you sell your wheat to the elevator. Then, buy the July futures to offset.

c) $7.50 - 6 = \$1.50$/bu for all.

d)

e) Hedging protects farmers from bad prices. When prices are high, farmers would lose money. Hedging does not maximize profits, it reduces profit variability.


d)
4
3
2
1
0
-1
-2
Payoffs
local
futures
total
4
5
6
7
8
9
10
July Cash Price

(4) a) You are short in the local market.

$\pi_{local} = 1.50 - C_{July}$

You benefit when prices fall.

b) You would take the long position now.

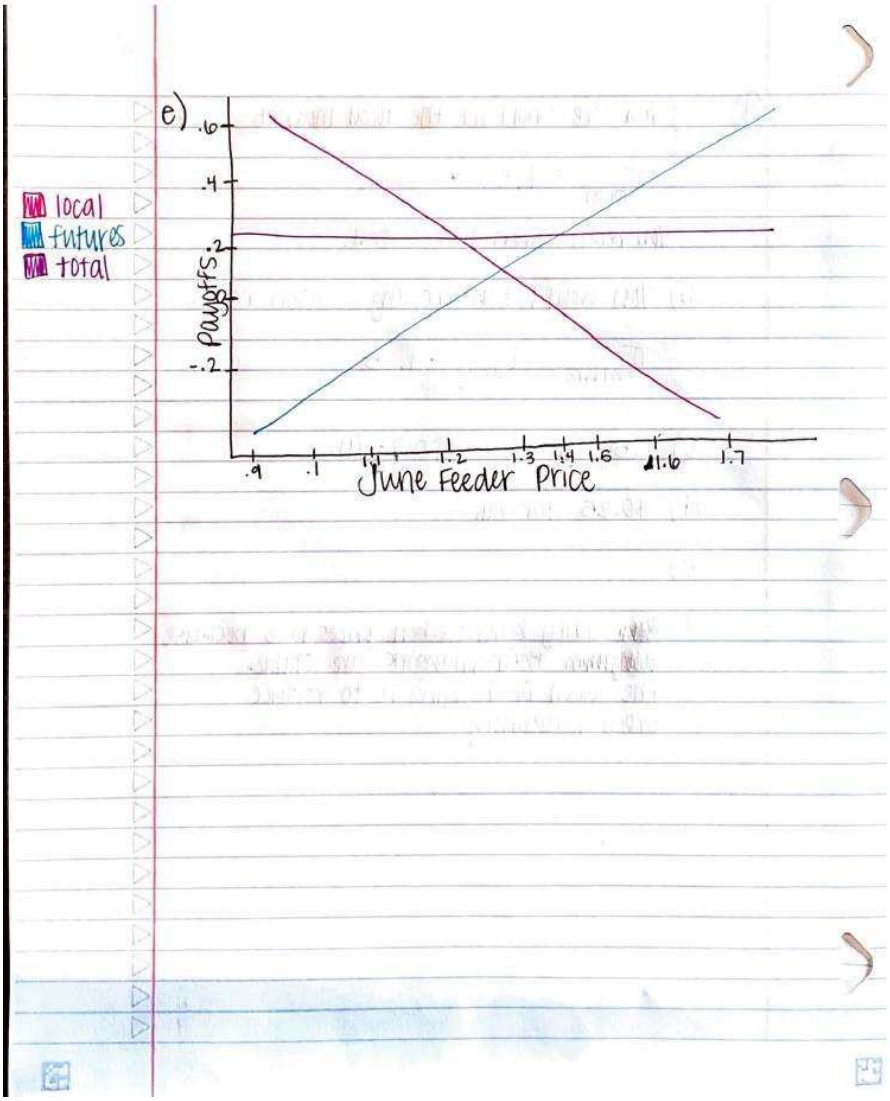
$\pi_{future} = F_{July} - 1.25$

c) $1.50 - 1.25 = \$0.25/lb$

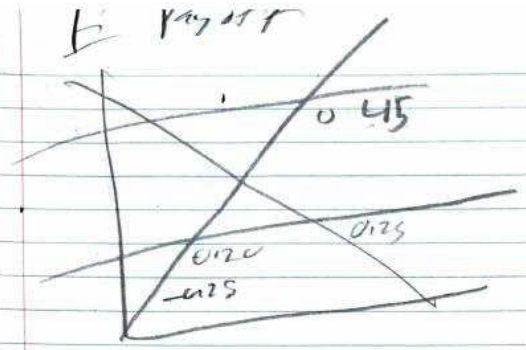
d) $0.25 for an.

e)

f) They benefit when prices rise because their margins are stable. The goal of hedging is to reduce profit variability.




**Student 321-10 (score 1)**




Futures. The futures
benefits firms when price drops

The futures hurts them
when the price increases.

The reason of hedging is to offset the
costs. Long when prices increase, short
when prices decrease.

Hedging is risk mitigation by
trading against themselves

4

A You are short.

Payoff futures = Value - [illegible]

B. You would buy to

Payoff = p[illegible] - p[illegible]

( 1.25 - 1.50 = -0.25

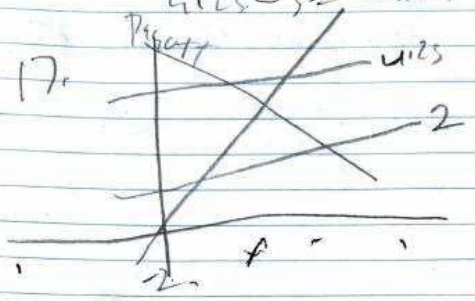
| D D | 1.25 | 1.50 |
|---|---|---|
| 1.05 | -0.20 | -0.45 |
| 1.25 | 0 | -0.25 |
| 1.50 | -0.125 | 0 |

C. $5,50 - 7,50 = -2$

$5,50 - 5,50 = 0$

$7,50 - 5,50 = 2$

$6,25 - 5 = 1,25$




E. The farmer gains when price increases in the local market but is worse off when price decreases. He offsets / trade a short.

They use locally when prices are favourable.

They will offset by buying.

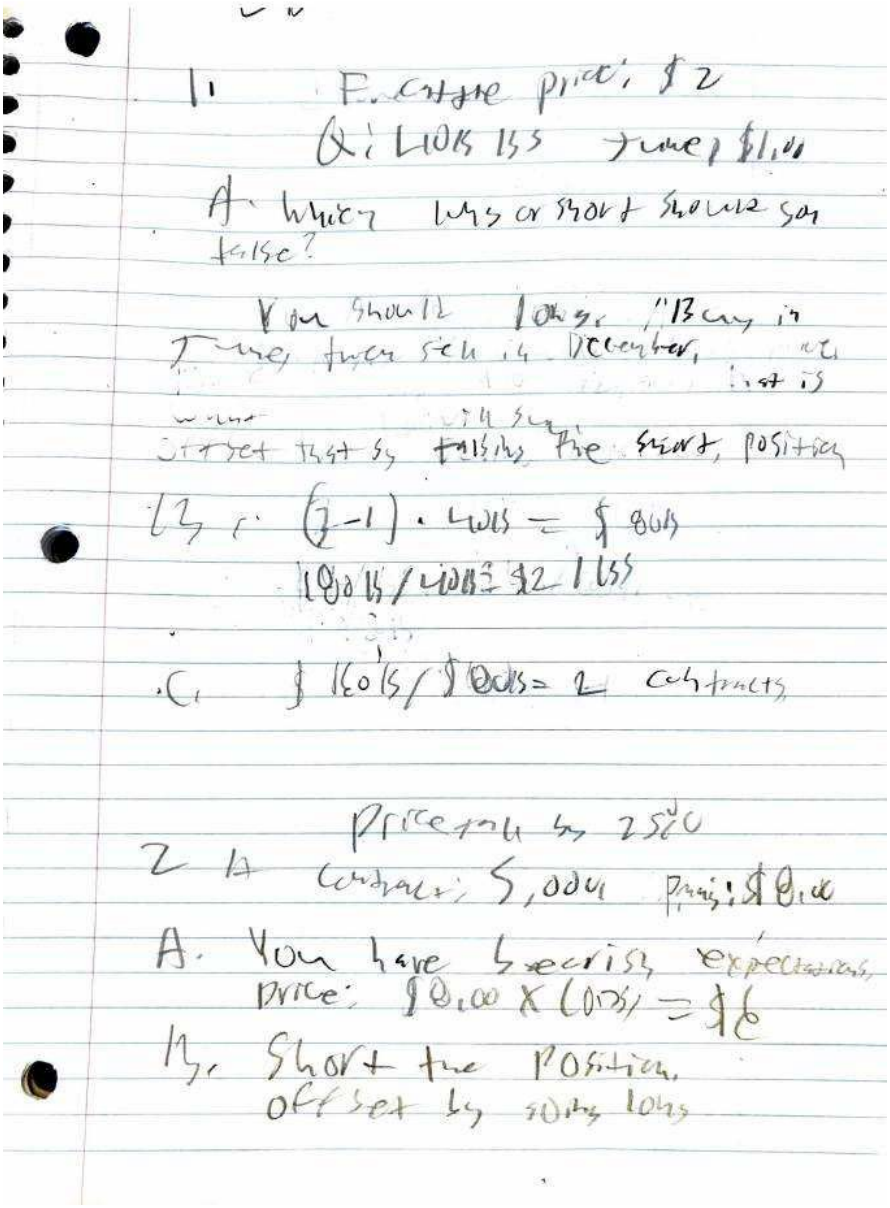
C.

D.

A. As a producer, you are
[illegible]

You want the price to
rise

B. To offset risk,
you'd short
7.50 ÷ 3 = $2.50
You'll receive July



1. Exercise price, $2
   Q: Long 1 S5 June, $1.00
   A. Which long or short should say false?
   You should long. "Buy in June, then sell in December," ... that is ... offset that by taking the short position
   L5: (2 − 1) · 400 = $400
   1000 / 400 = $2 / S5
   C. $160 / $400 = 2 contracts

Price risk by 25¢
2. 4 contracts; 5,000 price: $0.00
   A. You have bearish expectations, price: $0.00 × (0.05) = $0
   B. Short the position, offset by going long

**Student 321-11 (score 3)**

lab exercise 6

1) a) long position, y'all offset by taking a long position at 1.00 to sell at 3.00 in december

b) 3 - 1 profit = $2,
~~$80,000~~

c) 2 contracts

2) a) you are bearish, $6 a bushel

b) take a short position, offset w/ long position sell a contract for $8 now, buy a $6 contract in september

c) 8 - 6 = $2,
profit $10,000

d) 5,000 · .02 = 100
40,000 · .15 = + 6000
$6100

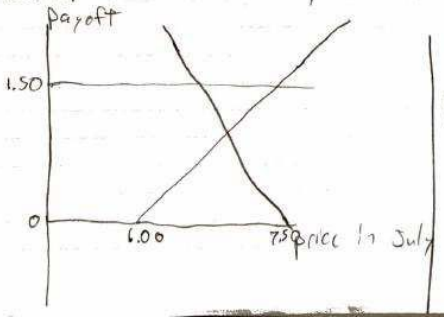
3) a) Naturally long, profit = $P_{\text{expiration, local}}$ − cost
you benefit when prices rise

b) would take a short position to offset
Profit = 7.5 − 6 = $1.5 buy a long contract

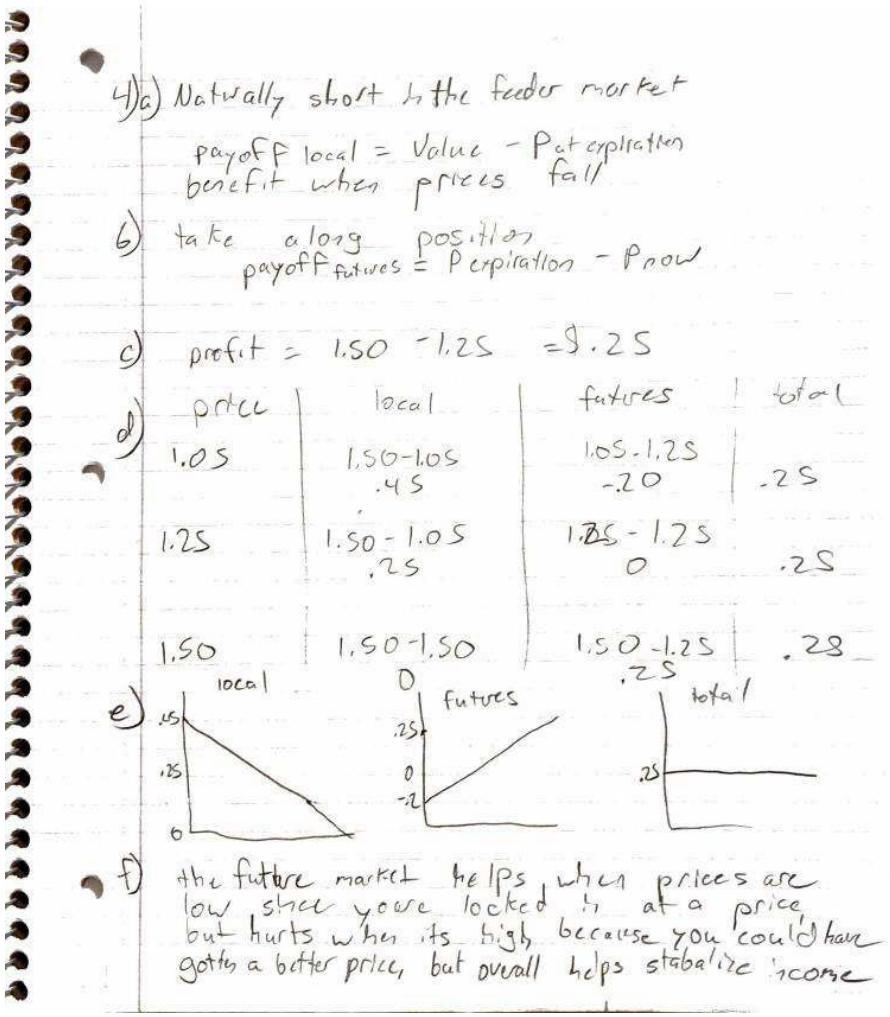
c)

| July price | 5.50 | 7.50 | 9.25 (in July) |
|---|---|---|---|
| local payoff | 5.50 − 6 | 7.50 − 6 | 9.25 − 6 |
| contract cost | = $−.50 | = $1.5 | $ 3.25 |
| futures payoff | 7.50 − 5.50 | 7.50 − 7.50 | 7.50 − 9.25 |
| expected cost-adj | = $2 | = $0 | = $−1.75 |
| total per bushel | 1.50 | 1.50 | 1.50 |

d)




e) the farmer benefits from lower price variability




**Student 321-12 (score 4)**

1 a) Long in June at $1.00/lb
offset by selling in Dec at $1.02/lb

b) price per lb = $.02/lb
contract .02 × 40,000 = $800

c) contracts to clear ≥ $160,000 ÷ 800 = 200 contracts

2 a) Bought
September $6.00/bu

b) short in may 88.00/bu buy back at $6.00

c) profits 8.00 − 6 = $2.00/bu
per contract 2 × 5000 = $10,000

d) may for 5 contracts
comission 32 × 5000 × 5 = $800
15% × (80 × 5000) = $6,000 per contract $30,000 total

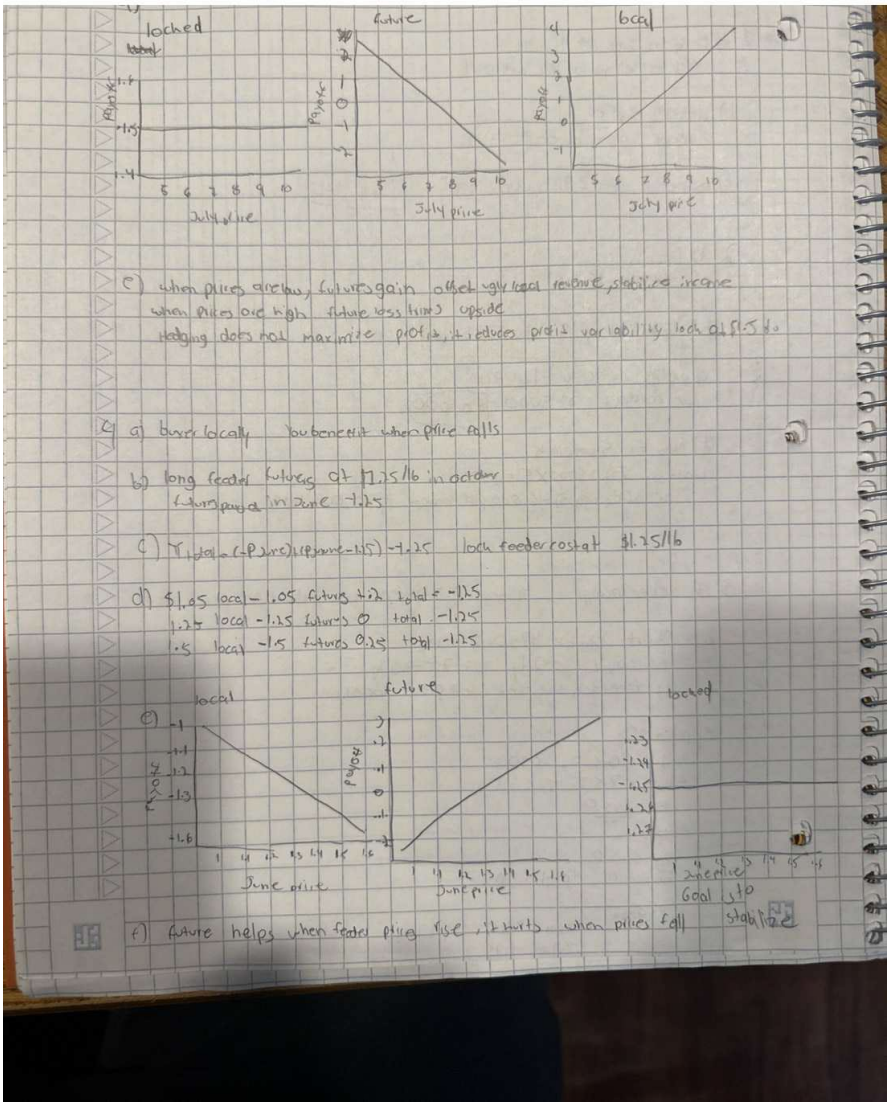
3 a) seller locally  If local = P − July = 0.00 benefit when price rises

b) Short July at $7.50 in may.
future part in July July = 7.5 − P July
July buy back the short, sell grain locally

c) P $5.50
P: 5.5
local: 5.0 − .6 = −.050
future 7.5 − 5.5 = 2.00
total 1.50

P = 7.5
local = 1.50
future = 0  total 1.50

If P = 9.25  local 3.25  total 1.50
future −1.75




**Student 321-13 (score 3)**

Lab Exercise 6

1. Assume that you are a speculator. From a friend working in the US Senate, you found out that there is a policy in the works that will place a tax on feedlot operators. This policy will go into effect in December. You know that this policy will increase the price of fed cattle by $2. A fed cattle contract is 40,000 pounds, and the price in June is $1.00/lb. (Ignore the commission fee and margin for now.)
   a. Which position (long or short) should you take? How will you offset that position? Explain the prices you will sell and buy a contract for.
   b. How much will you profit per pound if your price expectations are correct? How much will you profit if you trade one contract?
   c. How many contracts should you buy/sell in order to profit by at least $160,000?

2. Assume that you are a speculator. The USDA comes out with a report that the soybean harvest in September will be well above expectations. Using an EDM calculation, you find that prices will decrease by 25%. One soybean contract is 5,000 bushels and the current May price is $8.00/bu.
   a. Do you have bullish or bearish price expectations? What will the soybean futures price be in September if you are correct?
   b. Which position (long or short) should you take? How will you offset that position? Explain the prices you will sell and buy a contract for.
   c. How much will you profit per bushel if your price expectations are correct? How much will you profit if you trade one contract?
   d. Assume that you trade 5 contracts. You call your broker. You need to pay a commission fee of 2 cents/bu. You also need to deposit 15% of the contract value into a margin account. How much do you need to deposit in May?

3. Suppose you are a Montana farmer growing winter wheat. You intend to sell the wheat to local elevators after it is harvested, but you don't know the price you will be quoted by the elevator at the time of sale. It costs you $6/bu to produce the wheat.
   a. Which position are you in the local market? What is your local profit equation? Do you benefit when prices rise or fall?
   b. What position would you take in the futures market to offset local price variability risk? Suppose that in May you take a position on a July futures contract that is priced at $7.50/bu. What is your futures market profit equation? Explain what you would do in July just before the contract expires.
   c. Assume that the futures and local prices converge (are exactly the same in July). Given that you took a May-July futures contract priced at $7.50, calculate your per bushel profits in the local and in the futures markets if the price in July was one of the following: $5.50, $7.50, $9.25.
   d. Graph your local payoff, futures payoff, and total payoff.
   e. Discuss how the farmer benefits from hedging. Specifically, discuss the local, future, and overall payoffs when prices are low. Then, discuss the hedging tradeoffs that occur when prices are high (these are called hedging losses). Does hedging maximize profits or reduce profit variability?

4. You are a feedlot operator. You will need to purchase feeder cattle in June, and you will do so on the local market at the going price. Suppose you know that you can sell the finished cattle at $1.50/lb. But, you want to offset any price risk using the futures market. It is currently October. Suppose the current futures contract price for feeder cattle is $1.25/lb.
   a. Which position are you in the local market for feeder cattle? What is your local profit equation? Do you benefit when prices rise or fall?
   b. Which position should you take in the futures market to offset the price risk? What is your futures market profit equation?
   c. What is the total payoff if you implement a hedging strategy?
   d. Construct a table that illustrates your per pound payoff if the June price is one of the following: $1.05/lb, $1.25/lb, and $1.50/lb. Assume that the local and futures price in June is the same.
   e. Graph your local payoff, futures payoff, and total payoff.
   f. Discuss the benefits and costs of hedging for the feedlot operator. When does participating in the future market benefit their payoffs? When does participating in the futures market hurt their benefits? What is the goal of hedging?

effect in December. You know that this policy will increase the price of fed cattle by $2. A fed cattle contract is 40,000 pounds, and the price in June is $1.00/lb. (Ignore the commission fee and margin for now.)

a. Which position (long or short) should you take? How will you offset that position? Explain the prices you will sell and buy a contract for.
b. How much will you profit per pound if your price expectations are correct? How much will you profit if you trade one contract?
c. How many contracts should you buy/sell in order to profit by at least $160,000?

a) long - buy now. offset by buying now @ $1.00 and sell at $3.

b) $2.00

$2.00 (40000) = $80000

c) 2 contracts

will decrease by 25%. One soybean contract is 5,000 bushels and the current May price is $8.00/bu.

a. Do you have bullish or bearish price expectations? What will the soybean futures price be in September if you are correct?
b. Which position (long or short) should you take? How will you offset that position? Explain the prices you will sell and buy a contract for.
c. How much will you profit per bushel if your price expectations are correct? How much will you profit if you trade one contract?
d. Assume that you trade 5 contracts. You call your broker. You need to pay a commission fee of 2 cents/bu. You also need to deposit 15% of the contract value into a margin account. How much do you need to deposit in May?

a) Bearish as price decrease 25%.
$8.00 \cdot 0.75 = \$6.00$ bushel

b) Short position, offset by sell at B and buy at C.

c) $\$2.00$.
$2.00 \cdot (5000) = 10000$

d) $5 \cdot 5000 \cdot 0.07 = \$500$
$5 \cdot 5000 \cdot 8.00 \cdot 0.15 = \$30000$

deposit $= \$30,500$

the time of sale. It costs you $6/bu to produce the wheat.

a. Which position are you in the local market? What is your local profit equation? Do you benefit when prices rise or fall?
b. What position would you take in the futures market to offset local price variability risk? Suppose that in May you take a position on a July futures contract that is priced at $7.50/bu. What is your futures market profit equation? Explain what you would do in July just before the contract expires.
c. Assume that the futures and local prices converge (are exactly the same in July). Given that you took a May-July futures contract priced at $7.50, calculate your per bushel profits in the local and in the futures markets if the price in July was one of the following: $5.50, $7.50, $9.25.
d. Graph your local payoff, futures payoff, and total payoff.
e. Discuss how the farmer benefits from hedging. Specifically, discuss the local, future, and overall payoffs when prices are low. Then, discuss the hedging tradeoffs that occur when prices are high (these are called hedging losses). Does hedging maximize profits or reduce profit variability?

a) Naturally long

$Payoff_{local} = P_{wheat}^{winter} - \$6.00$

benefit when prices rise

b) Short in futures market

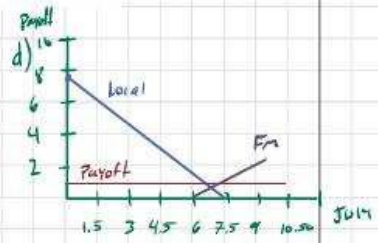
$Payoff_{future} = P^{May} - P^{July} = 7.50 - P^{July} = 1.50/bu$

Buy in July in futures market to offset your future

c)

| | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| $Payoff_{local} = P_w^{July} - Cost^{May}$ (6) | 5.50 − 6 = −1.50 | 7.50 − 6 = 1.50 | 9.25 − 6 = 3.25 |
| $Payoff_{future} = P^{7.50\,May} - P^{July}$ | 7.50 − 5.50 = 2.00 | 7.50 − 7.50 = 0 | 7.50 − 9.25 = −1.75 |
| | 1.50 | 1.50 | 1.50 |

d)




e) hedging makes your profit always equal.

| | Low P | High P |
|---|---|---|
| Local | − Payoff | + Payoff |
| future | + Payoff | − Payoff |

π will always be same in Perfect Mkt. hedging reduces π variability

$1.50/lb. But, you want to offset any price risk using the futures market. It is currently October. Suppose the current futures contract price for feeder cattle is $1.25/lb.

a. Which position are you in the local market for feeder cattle? What is your local profit equation? Do you benefit when prices rise or fall?
b. Which position should you take in the futures market to offset the price risk? What is your futures market profit equation?
c. What is the total payoff if you implement a hedging strategy?
d. Construct a table that illustrates your per pound payoff if the June price is one of the following: $1.05/lb, $1.25/lb, and $1.50/lb. Assume that the local and futures price in June is the same.
e. Graph your local payoff, futures payoff, and total payoff.
f. Discuss the benefits and costs of hedging for the feedlot operator. When does participating in the future market benefit their payoffs? When does participating in the futures market hurt their benefits? What is the goal of hedging?

a) Naturally Short.

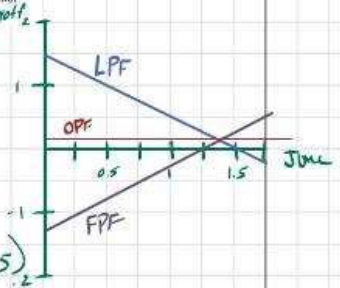
Payoff = $1.50 - P_L^{exp}$

b) long Position

Payoff = $P_F^{exp} - 1.25$

c) Overall PF = $(1.50 - P_L^{exp}) + (P_F^{exp} - 1.25)$

e)




d)

| | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| − LPF | 1.5 − 1.05 = 0.45 | 1.5 − 1.25 = 0.25 | 1.5 − 1.5 = 0 |
| − FPF | 1.05 − 1.25 = −.2 | 1.25 − 1.25 = 0 | 1.25 − 1.5 = −0.25 |
| − OPF | $0.25 | $0.25 | $0.25 |

f) Benefit is a more consistant overall payoff. Cost is risk of local mkt price increasing, in future market, benefit when prices are low and dont benefit when prices are high. Can hurt when your price in FM decreases below 1.25, such that you loose money. Goal of hedging is consistant Π

**Student 321-14 (score 3)**

10/9/25 - Lab Exercise #6

1) $P^{Dec}_{fed\ cattle} \uparrow \$2$ Contract = 40,000 lbs

$P^{June}_{fed\ cattle} = \$1.00/lb$

a.

Take long position. Offset by selling a contract (short position).

$P^{June}_{fed\ cattle} = 40{,}000 \times 1.00 = \$40{,}000$ (buy)

$P^{Dec}_{fed\ cattle} = 40{,}000 \times 3.00 = \$120{,}000$ (sell)

b.

$P_{fed\ cattle} = 120{,}000 - 40{,}000 = \$80{,}000$

1 contract

$\pi/lb = 3.00 - 1.00 = \$2.00/lb$

c. $\$80{,}000 \times 2 = \$160{,}000$

You must buy at least 2 contracts.

2) Soybean harvest $\uparrow$, $P_{soybeans} = -25\%$

Contract = 5,000 bu $P^{May}_{soy} = \$8.00/bu$

a. Bearish. Prices will decrease by \$2.00 to \$6.00.

$8.00 \times .25 = \$2.00$ $8 - 2 = \$6.00$

b. Take short position (P↓). Offset by purchasing a contract (long).

$P_{soy}^{May} = 8.00 \times 5.000 = \$40,000/\text{contract (sell)}$

$P_{soy}^{new} = 6.00 \times 5000 = \$30,000/\text{contract (buy)}$

c.

$\pi/1 \text{ contract} = \$40,000 - 30,000 = \$10,000$

$\pi/\text{bu} = 8.00 - 6.00 = \$2.00/\text{bu}$

d.

5 contracts = $40,000 \times 5 = \$200,000$

Commission: $25,000 \times .02 = \$500$

Margin: $.15 \times 200,000 = \$30,000$

May deposit: $30,000 + 500 = \$30,500$

3) $\text{Cost}_{\text{wheat}} = \$6.00/\text{bu}$

a. Naturally long in local market. Benefit when prices rise.

$$\text{Payoff}_{\text{local}} = P_{\text{local}}^{\text{expiration}} - \text{Cost}$$

b. Take a short position. $\text{Payoff}_{\text{local}} = \text{Value} - P_{\text{local}}^{\text{expiration}}$

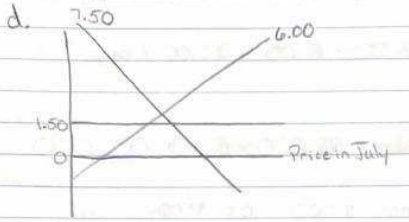
$P_{July} = \$7.50/\text{bu}$. $\text{Payoff}_{\text{local}} = 7.50 - 6.00 = \$1.50$

Sell the contract and purchase another.

c.

| prices in July | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| local payoffs $P^{July}_{local} - 6$ | 5.50 - 6 = -.50 | 7.50 - 6 = 1.50 | 9.25 - 6 = 3.25 |
| futures payoffs $7.50 - P^{July}_{futures}$ | 7.50 - 5.50 = 2.00 | 7.50 - 7.50 = 0 | 7.50 - 9.25 = -1.75 |
| Overall local + futures | -.50 + 2 = 1.50 | 1.50 + 0 = 1.50 | 3.25 + (-1.75) = 1.50 |

d.




e. In the local market, when prices are low, farmers can take short position in the futures market (buys back cheaper and gains). Overall this results in a stable and positive return because the gains in the futures market offsets the low prices in the local market. With the hedge, farmers can still earn a profit. When prices are high in the local market, futures prices also rise and the farmer must buy back at a loss. The futures loss offsets any extra profit. Overall, hedging reduces profit variability.

4) Feedlot operator. Sell finished cattle @ $1.50/lb. $P^{Oct} = \$1.25/lb.$

a. Naturally short. Benefit when prices fall.

$Payoff_{local} = Value - P^{Expiration}_{local} = 1.50 - P^{June}_{local}$

b. Take long position in futures market.

$Payoff_{futures} = P^{Expiration}_{futures} - P^{Oct}_{futures} = P^{June}_{futures} - 1.25$

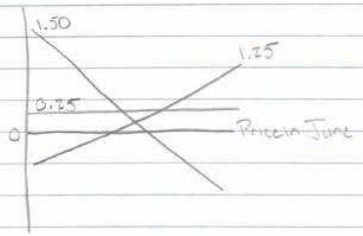
c.

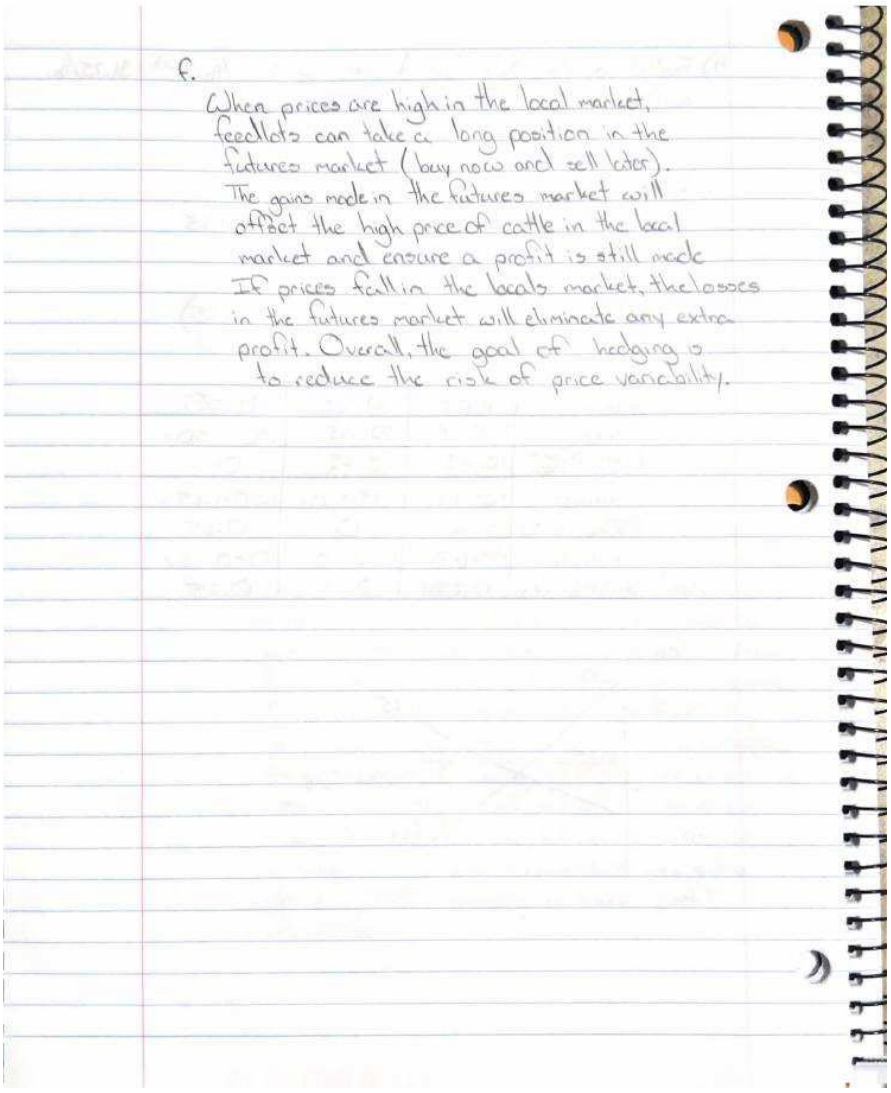
$Payoff_{overall} = \left(1.50 - P^{June}_{local}\right) + \left(P^{June}_{futures} - 1.25\right)$

d.

| price in June | $1.05 | $1.25 | $1.50 |
|---|---|---|---|
| local $(1.50 - P^{June}_{local})$ | 1.50-1.05= 0.45 | 1.50-1.25= 0.25 | 1.50-1.50= 0 |
| futures $(P^{June}_{futures} - 1.25)$ | 1.05-1.25= -.2 | 1.25-1.25= 0 | 1.50-1.25= 0.25 |
| overall local+futures | .45+(-.2)= 0.25 | 0.25+0= 0.25 | 0+0.25= 0.25 |

e.




f.
When prices are high in the local market, feedlots can take a long position in the futures market (buy now and sell later). The gains made in the futures market will offset the high price of cattle in the local market and ensure a profit is still made. If prices fall in the locals market, the losses in the futures market will eliminate any extra profit. Overall, the goal of hedging is to reduce the risk of price variability.

**Student 321-15 (score 3)**

lab 6 Sage Hansen

1

a) Long position and buying a contract. I would hope to sell it later with a higher price.
Bullish Outlook

b) profit: (S$ - P$) · size · #
(3-1) · 40,000 · 1 = 80,000
80,000/40,000 = 2/1 or 2

c) 2 contracts
160000 · (3-1) · 40000 · c
160000 / 80000 = 80000
C = 2

2

a) We are bearish hoping to sell now then buy back at a lower price. 8(.25) = 16.00

b) Short, sell at $8.00, hoping to buy back at $16.00. We will buy a contract now.

c) profit: (8-16) · 5000 · 1 = 1000
$2 per bushel free commission

d) .02 · 5(5000) = 500
% contracts bushels FP
15 · 5 · 5000 · 8 = 30000
3000 + 500 = 30500 deposit price

3

a▷ Prices will rise in local market, seller has naturally long position.

payoff$_{local}$ = $P^{expiration}_{local}$ - 6

b▷ take short to offset

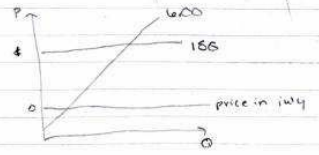
payoff futures = 7.5 - $P^{July}_{futures}$

• buy offset in July, since we sold in May, hoping for a lower price long-run

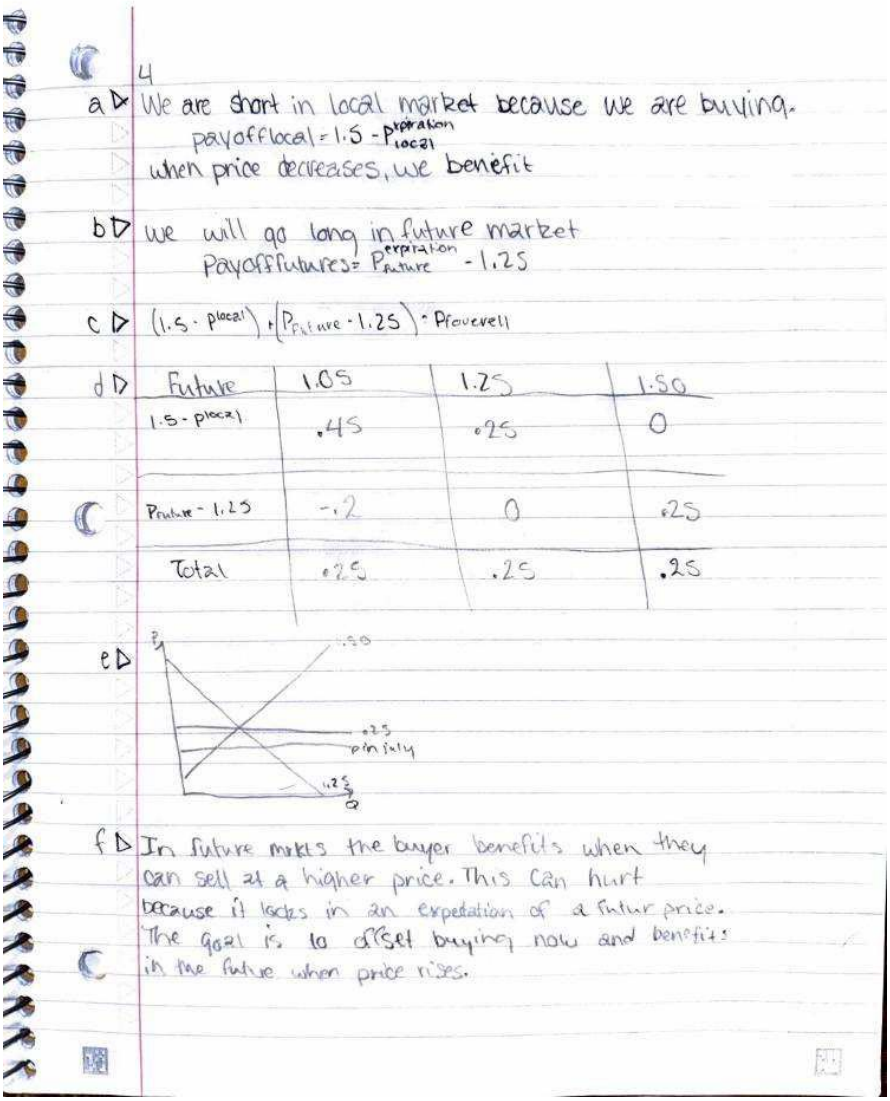
c▷

| Price in July LOCAL | 5.5 | 7.5 | 9.25 |
|---|---|---|---|
| • $P^{July}_{local}$ - 6 | -0.5 | 1.50 | 3.25 |
| FUTURE | | | |
| = 7.5 - $P^{new}_{future}$ | 2 | 0 | -1.75 |
| TOTAL | 1.5 | 1.5 | 1.5 |

d▷




e▷ Farmer benefit because it gives you money at bad times, but costs you at good times. They will benefit better in the future markets when prices fall, Reducing profit variability



4

a) We are short in local market because we are buying.
payoff local = 1.5 - $P_{local}^{expiration}$
when price decreases, we benefit

b) we will go long in future market
payoff futures = $P_{future}^{expiration}$ - 1.25

c) $(1.5 - P_{local}) + (P_{future} - 1.25) = P_{overall}$

d)

| Future | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| 1.5 - $P_{local}$ | .45 | .25 | 0 |
| $P_{future}$ - 1.25 | -.2 | 0 | .25 |
| Total | .25 | .25 | .25 |

e)




f) In future markets the buyer benefits when they can sell at a higher price. This can hurt because it locks in an expectation of a futur price. The goal is to offset buying now and benefits in the future when price rises.

**Student 321-16 (score 3)**

# Lab #6

1.

a. You should take the long position by buying in June, selling a contract in december. You will buy at $1.00/lb and sell for $3.00/lb after the policy is made in december

b. $3.00 - $1.00 = $2.00/lb (40000) = $80,000
the profit per pound will be $2.00 the profit with the contract will be $80,000

c. $160,000 / $80,000 = 2
you should buy and sell 2 contracts.

2.

a. 8.00 (1-.25) = $6.00
expecting bullish with a price of $6.00

b. You should take short position, sell at $8.00/lbs and buy contract at $6.00/lbs to offset position

c. $8.00 - $6.00 = $2.00/lbs
$2.00/lbs (5000) = $10,000
You will profit $2.00/lbs. The profit if you trade one contract will be $10,000

d. 5 * 5000 = 25000 lbs
0.02/lbs * 25000 = $ 505 total
5060 - $8.00 = 40000 - 15% = $6,000
6000 . 5
margin deposit $3,0000
commision fee = $500

Lab

3.

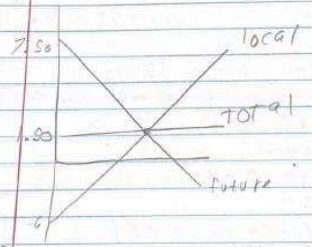
a. Local profit per bu = P - 6
The farmer benefits sells short run when prices rise because revenue will increase

b. future profit = 7.50 - P
The farmer will take short run to offset risk of equity prices. in July the farmer would buy back the future contract to close out position

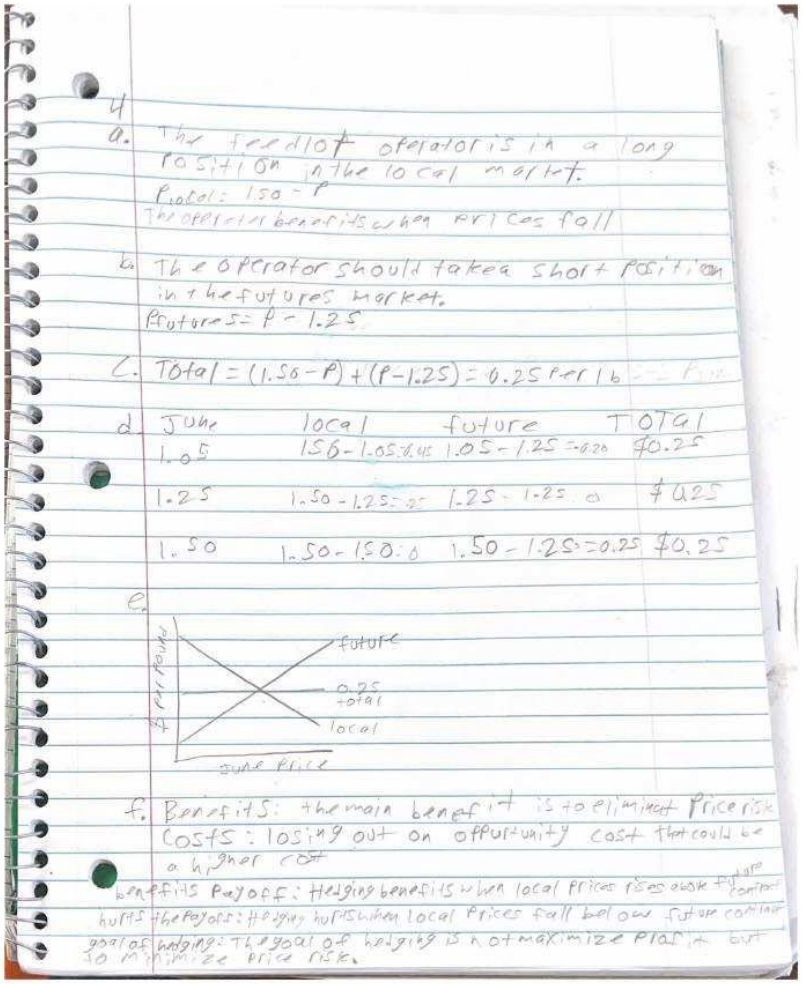
c.

| | local | future | Total |
|---|---|---|---|
| Case 1 $5.50 | 5.50-6 = -0.50 | 7.50-5.50 = 2.00 | 1.50 |
| Case 2 $7.50 | 7.50-6 = 1.50 | 7.50 - 7.50 = 0 | 1.50 |
| Case 3 $9.25 | 9.25 - 6 = 3.25 | 7.50 - 9.25 = 1.75 | 1.50 |

d.




e. Hedging: The benifit of hedging is to reduce risk profit variability. protection against the risk of falling prices. with low prices the farmer experiences a loss in local market however the loss is more offset by the gain in the futures market resulting in a stable profit




**Student 321-17 (score 3)**

Lab 6:

1a) Since you expect the price to rise, you should take a long position and buy a contract now to sell later. You would offset this by selling a contract when you buy this one. The contract value in June is $1.00 \times 1 \times 40{,}000 = \$40{,}000$.

b) offsetting $\Pi$: $(3.00 - 1.00) \times 40{,}000 \times 1 = \$80{,}000$, $\Pi = \$2/16$

c) $160{,}000 = 2.00 \times 40000 \times C$

$2 = C$, you should buy & sell 2 contracts

2a) your price expectations are bearish, a 25% decrease would mean Future price will be $(8 \times .75) = \$6.00$

b) with a bearish price outlook, you should take a short position and sell a contract now. You'd offset this contract by buying a contract. The contract price would be $8.00 \times 1 \times 5{,}000 = \$40{,}000$

2c) offset $\pi$: $(8.00 - 6.00) \times 1 \times 5{,}000 = \$10{,}000$, $\pi = \$2.00/bu$

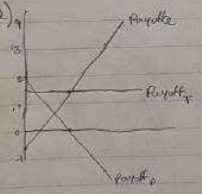
2d) commission fee: $.02 \times 5 \times 5000 = \$500$ (fee + margin)
margin: $(8.00 \times 5 \times 5000) \times .15 = \$30{,}000$ deposit = \$30,500

3a) as a producer, you're naturally long in the local market local $\pi = (p^{per}_{L} - cost)$, you're profitable if prices rise

3b) you should take a short position in the futures market to offset local price variability. Futures $\pi = p^{may}_{f} - p^{July}_{f}$. In July you would sell a futures contract to offset local price variability.

3c) $\pi$: $(5.50 - 6.00) + (7.50 - 5.50)$ $\pi = (7.50 - 6.00) + (7.50 - 7.50)$ $\pi = (9.25 - 6.00) + (7.50 - 5.75)$
$= -.50 + 2.00 = \$1.50$ $= 1.50 + 0 = \$1.50$ $= 3.25 - 1.75 = \$1.50$

3d)

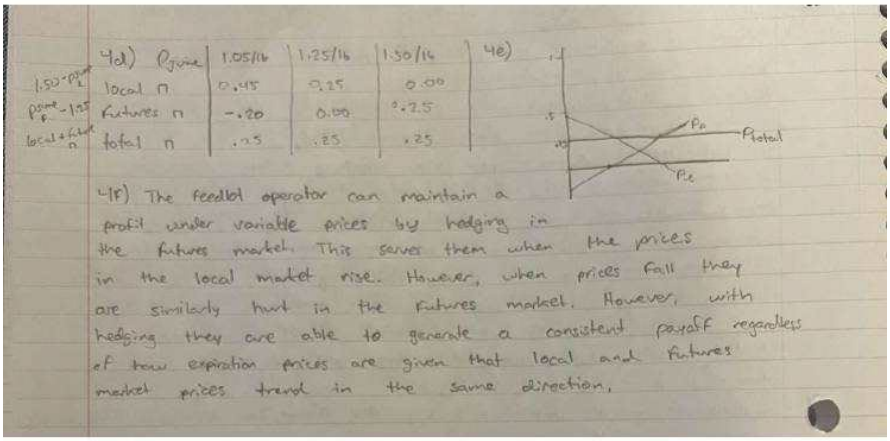



3e) hedging can benefit the farmer by offsetting price variability in the local market since going short in the futures market will still allow the farmer a profit if prices fall. When prices are high, the farmer must deal with hedging losses by losing in the futures contract, while a safeguard against falling prices, the farmer will lose out on potential gains from participating in the futures market.

4a) You're naturally short in the local market since you must purchase feeder cattle. Your local profit equation is value $- p^{per}_{L}$, so you will benefit when prices fall.

4b) To offset price variability, you'd take a long position in the futures market, your profit equation is $p^{per}_{F} - p^{now}_{F}$, generating a profit when prices rise.

4c) $(\text{Value} - p^{per}_{L}) + (p^{per}_{F} - p^{now}_{F})$
$\sim (1.50 - p^{per}_{L}) + (p^{per}_{F} - 1.25)$



4d)

| $P_{given}$ | 1.05/lb | 1.25/lb | 1.50/lb |
|---|---|---|---|
| local π | 0.45 | 0.25 | 0.00 |
| futures π | -.20 | 0.00 | +.25 |
| total π | .25 | .25 | .25 |

4e)




4f) The feedlot operator can maintain a profit under variable prices by hedging in the futures market. This saves them when the prices in the local market rise. However, when prices fall they are similarly hurt in the futures market. However, with hedging they are able to generate a consistent payoff regardless of how expiration prices are given that local and futures market prices trend in the same direction.

**Student 321-18 (score 4)**

You would buy at the June price of $1, Then sell it at the future of $3.

b. Bought 40,000 lbs for $1
Sell 40,000 lbs for $3
3-1 = 2 × 40,000 = $ 80,000
TT per lb $2
TT total = $ 80,000

c. $\frac{160,000}{80,000} = (3-1) \times 40,000 \cdot (n)$
n = 2 contracts

2. a. You would have a bearish price expectation
$8.00 × .75 = $6.00, prices will be $6 in September.

b. Take a short position and offset with a long position in September.
Sell in May at $8, buy in September at $6

c. (8-6) × 5,000 × 1 = 10,000
QT = $2/bushel
TT = $10,000 profit for a contract

d. 5,000 × 5 = 25,000 × .02 = 500
commission fee = 500
contract @ 25,000
25,000 × 8.00 = 200,000 × .15 = 30,000
total May deposit is $30,500

Payoff local = $P_{local} \times cost$ $Payoff_{local} = P_{local} - 6.00$

You benefit when prices rise.

b. Take the short position to offset.

$Payoff_{future} = P^{new}_{futures} - P^{exp}_{futures}$ $Payoff\ futures = P_{may} - P_{july} = 7.50 - P_{July}$

In July you would offset your future short position by taking a future long position.

c.

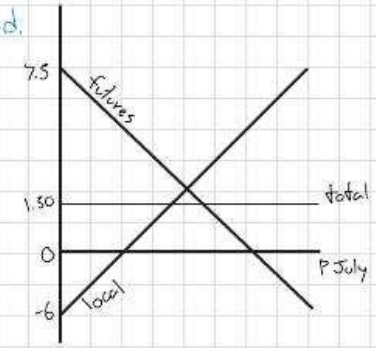
| Payoff futures | Payoff local |
|---|---|
| 7.50 - 5.50 = $2 | 5.50 - 6 = $-.50 |
| 7.50 - 7.50 = $0 | 7.50 - 6 = $1.50 |
| 7.50 - 9.25 = $-1.75 | 9.25 - 6 = $3.25 |

2 + -.5 = $1.50 $\pi$ = $1.50

0 + 1.50 = $1.50 $\pi$ ↓

-1.75 + 3.25 = $1.50 $\pi$

d.




e. Farmers benefit from because it reduces profit variability. When prices are low you lose money money at the local, but gain by shorting the futures. When prices are high, you gain locally but lose in futures. Overall, you don't maximize profits, but decrease variability.

$Payoff_{local}$ = Value − $P_{local}$

$Payoff_{local}$ = \$1.50/lb − $P^{prop}_{local}$

b. In futures you should take a long position.

Payoff futures = $P^{prop}_{futures} - P^{prop}_{futures}$

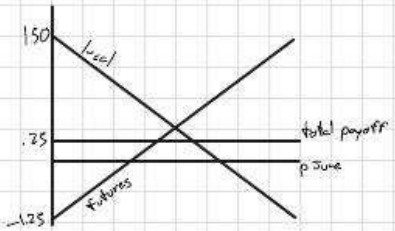
Payoff futures = $P^{prop}_{futures} - 1.25$

c. overall = $(1.50/lb - P^{June}_{local}) + (P^{June}_{futures} - 1.25/lb)$

d.

| $P^{June}$ | 1.05/lb | 1.25/lb | 1.50/lb |
|---|---|---|---|
| local 1.50/lb − $P^{June}$ | .45 | .25 | 0 |
| futures $P^{June}$ − 1.25/lb | −.20 | 0 | .25 |
| Overall $ | .25/lb | .25/lb | .25/lb |

e.




f. A feedlot benefits from hedging when selling prices are high in the local market. They hurt when prices are low in the local market & high in the futures market. Hedging ensures stability again.

**Student 321-19 (score 3)**

# Lab 6

1.

a. Long. Purchase a short contract. Buy at $1.00/pound sell at $3.00/pound.

b. $2.00/pound, $80,000

c. 2.

2.

a. [redacted], Bearish, $6.00

b. Short

c. $2.00 $10,000

d. 25K bushels x .02 = $500 comm fee,

8.00 * 25,000 = ~~25,000~~ 200,000 * .15 = 30,000

$30,500

3. Naturally

a. Long

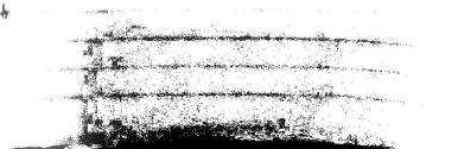
Rise

$Payoff_{local} = P^{expiration}_{local} - Cost$ 6.00

b. Short,

$Payoff_{futures} = P^{new}_{futures} - P^{previous}_{futures}$ => Purchase an offsetting short contract at $7.50

c. $Payoff_{futures} = 7.50 - P^{previous}_{futures}$



3

C. $PF_{overall} = (5.50 - 6) + (7.50 - 5.50)$

$\$1.50 = -.50 + 2.00$

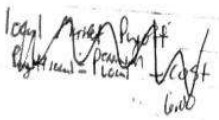
$PF_{overall} = (7.50 - 6) + (7.50 - 7.50) = \$1.50$

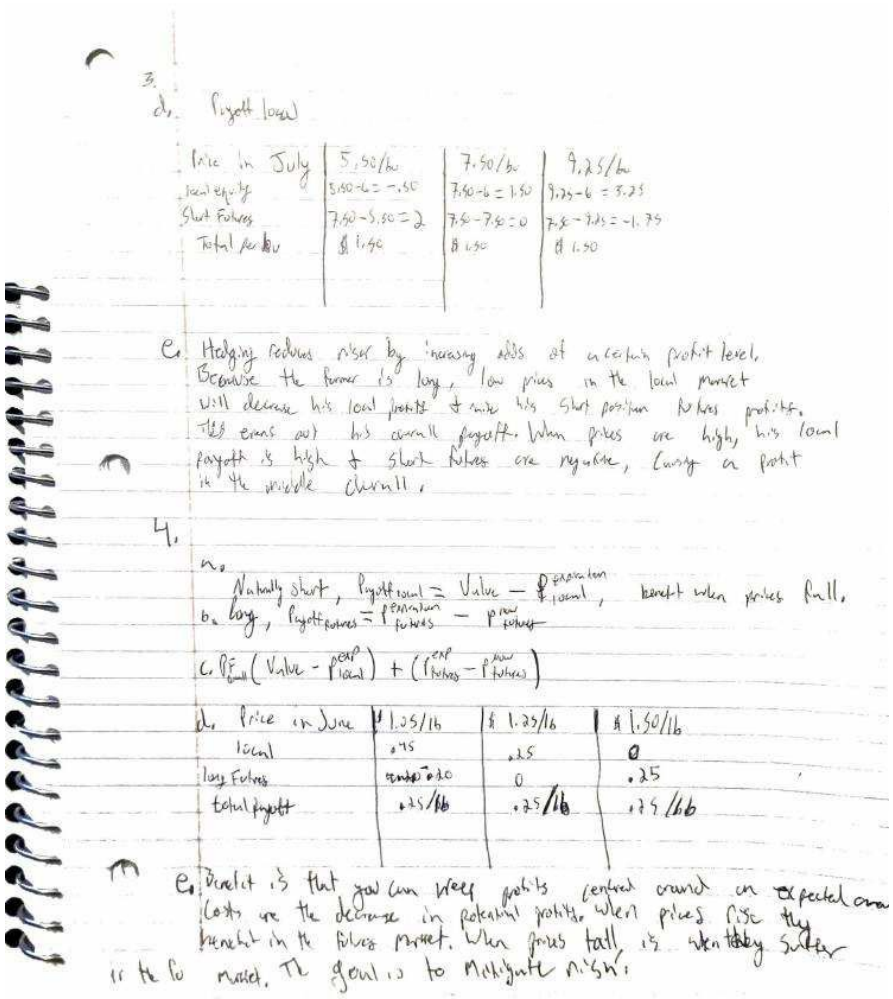
$PF_{overall} = (9.25 - 6) + (9.25 - 7.50)$

9.25 Payoff local $= (9.25 - 6) = 3.25$
Payoff futures $= (7.50 - 9.25) = -1.75 = 1.50$

5.50 Payoff local $= (5.50 - 6) = -.50$
Payoff futures $= (7.50 - 5.50) = 2 = 1.50$

7.50 Payoff local $= (7.50 - 6) = 1.50$
Payoff futures $= (7.50 - 7.50) = 1.50$





3.

d. Payoff locus

| Price in July | $5.50/lb | $7.50/lb | $9.25/lb |
|---|---|---|---|
| local equity | 5.50 − 6 = −.50 | 7.50 − 6 = 1.50 | 9.25 − 6 = 3.25 |
| Short Futures | 7.50 − 5.50 = 2 | 7.50 − 7.50 = 0 | 7.50 − 9.25 = −1.75 |
| Total per lb | $1.50 | $1.50 | $1.50 |

e. Hedging reduces risk by increasing odds of a certain profit level. Because the farmer is long, low prices in the local market will decrease his local profits & raise his short position futures profits. This evens out his overall payoff. When prices are high, his local payoff is high & short futures are negative, causing a profit in the middle overall.

4.

a. Naturally short, $\text{Payoff}_{\text{local}} = \text{Value} - \$^{\text{expected}}_{\text{local}}$, benefit when prices fall.

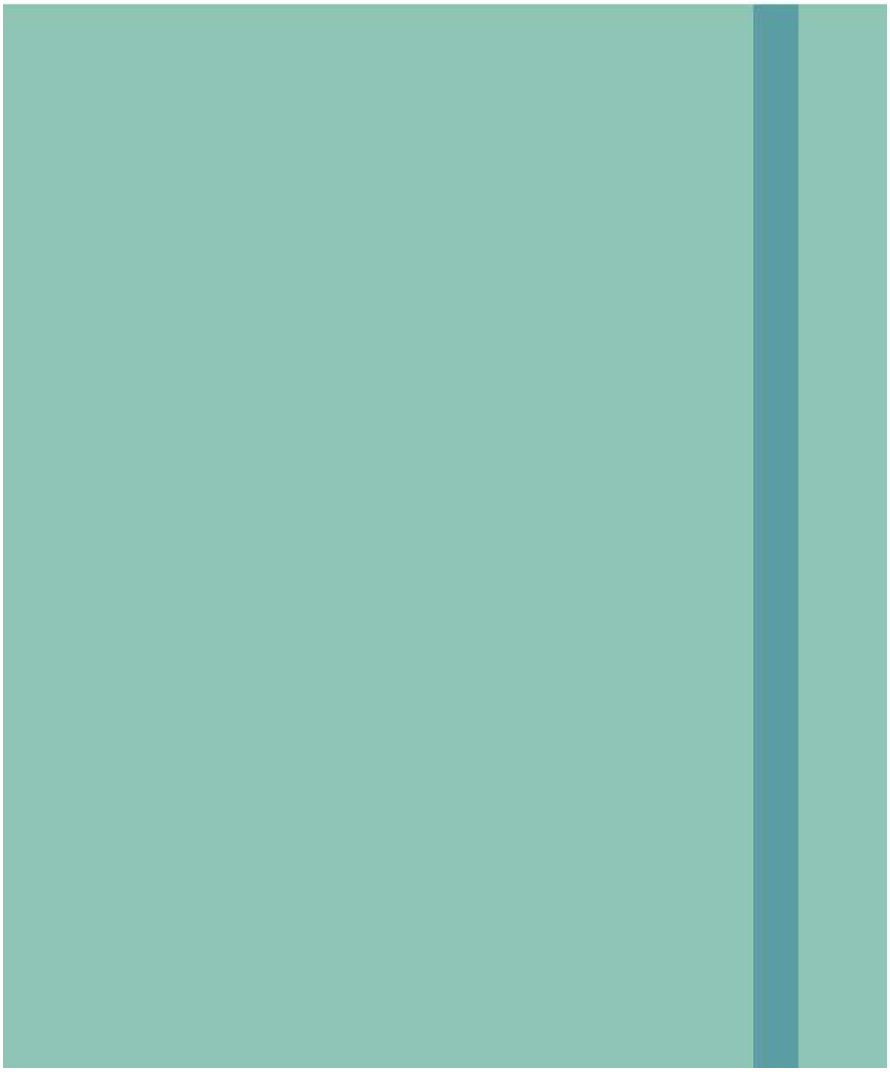
b. Long, $\text{Payoff}_{\text{futures}} = \$^{\text{expiration}}_{\text{futures}} - \$^{\text{now}}_{\text{futures}}$

c. $\$^{\text{E}}_{\text{profit}}\left(\text{Value} - \$^{\text{exp}}_{\text{local}}\right) + \left(\$^{\text{exp}}_{\text{futures}} - \$^{\text{now}}_{\text{futures}}\right)$

| d. Price in June | $1.25/lb | $1.25/lb | $1.50/lb |
|---|---|---|---|
| local | .75 | .25 | 0 |
| long Futures | .50 | 0 | .25 |
| total payoff | $1.25/lb | $1.25/lb | $1.75/lb |

e. Benefit is that you can keep profits centered around an expected area. Costs are the decrease in potential profits when prices rise they benefit in the futures market. When prices fall, it's when they suffer in the futures market. The goal is to mitigate risk.

**Student 321-20 (score 4)**



buy at June price of $1 per pound and selling it at the future price of $3

(b) buy 40,000 lbs for $1
Sell 40,000 lbs for $3
3-1 = $2 x 40,000 = $80,000

Π per pound = $2
Π total = $ 80,000

(c) $160,000 = (3-1) \times 40,000 \cdot (n)$

$160,000 = 2 \times 40,000 (n)$

$\frac{160,000}{80,000} = \frac{80,000n}{80,000}$

$n = 2$

You should buy 2 contracts

8.00 x .75 = $ 6

Prices will be $6 in September

(b) take a short position, offset with a long position
Sell in May at $8.00, buy in September at $6.00

(c) $|8.00 - 6.00| \times 5{,}000 \times 1 =$

$2 \times 5{,}000 \times 1 = 10{,}000$

$\pi$ = $2 per bushel

$\Pi$ = $10,000 total profit for 1 contract

(d) $5{,}000 \times 5 = 25{,}000 \times .02 = 500$

Commision fee = 500

Contract Q = 25,000

$25{,}000 \times 8.00 = 200{,}000 \times 0.15 = 30{,}000$

Margin = 30,000

You need to deposit $30,500 in May

You benefit when prices rise

(b) Take short position to offset.

$Payoff_{future} = P^{now}_{futures} - P^{ex}_{futures}$ $P_{payoff\ futures} = P_{May} - P_{July} = 7.50 - P_{July}$

In July you would offset your future short position by taking a future long position

(c)

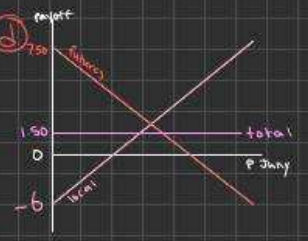
| Payoff futures | Payoff local |
|---|---|
| 7.50 - 5.50 = $2 | 5.50 - 6 = $-0.50 |
| 7.50 - 7.50 = $0 | 7.50 - 6 = $1.50 |
| 7.50 - 9.25 = $-1.75 | 9.25 - 6 = $3.25 |

$2 + -.50 = \$1.50$ If 5.50 = $1.50

$0 + 1.50 = \$1.50$ If 7.50 = $1.50

$-1.75 + 3.25 = \$1.50$ If 9.25 = $1.50

(d)




(e) Farmers benefit from hedging because it ensures a stable price and protects profits. When prices are low you loose money locally, in futures market you gain. When prices are high, you gain locally and loose in futures. The goal isn't to maximize profits, rather protect against loosing money. Hedging reduces profit variability.

$payoff_{local} = Value - p^{expiration}_{local}$

$Payoff_{local} = 1.50/lb - p^{expiration}_{local}$

(b) In futures take a long position

$Payoff_{futures} = p^{expiration}_{futures} - p^{now}_{futures}$

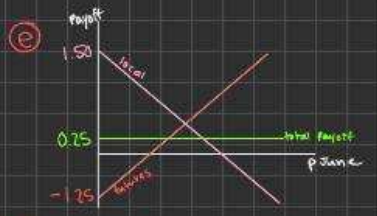
$Payoff_{futures} = p^{expiration}_{futures} - 1.25$

(c) overall payoff $= (1.50/lb - p^{June}_{local}) + (p^{June}_{futures} - 1.25/lb)$

(d)

| $p_{June}$ | 1.05/lb | 1.25/lb | 1.50/lb |
|---|---|---|---|
| local $1.50/lb - p_{June}$ | 1.50 - 1.05 = 0.45 | 1.50 - 1.25 = .25 | 1.50 - 1.50 = 0 |
| futures $p_{June} - 1.25$ | 1.05 - 1.25 = -.20 | 1.25 - 1.25 = 0 | 1.50 - 1.25 = .25 |
| overall $\pi$ | 0.25/lb | 0.25/lb | 0.25/lb |

(e)




(f) A feedlot operator benefits from hedging when selling prices are high in the local market and low in the futures market. The hurt when prices are low in the local market and high in futures. Hedging ensures a stable prices.

**Student 321-21 (score 3)**

Lab exercise # 6

(1) a- You would take the long position, and offset it in the future taking the short position & selling later.

~ buy the contract in June for 1 $ & sell in december for 3$.

b- $\Pi = (3-1) \times 1 \times 4{,}000 = 80{,}000$

$80{,}000 / 40{,}000 =$ **2 $ per lb**

c- You should sell/buy 2 contracts to have a profit of 160,000.

$(3-1) \times (X) \times 40{,}000 = 160{,}000$

**X = 2**

(2) a- Bearish $-8.25 = 2$

$8 - 2 =$ **6 $**

b) would take the short position, later you will take the long position & sell later to offset it.

c- $(8-6) \times 5{,}000 \times 1 =$ - if you trade 1 contract

$2\ (5{,}000) =$ 10,000 you make 10,000.

(2)

d- $.02(25,000) = 500$

$15\% = 25,000 \cdot 8 \cdot .15 = 30,000$

$TD = 500 + 30,000 = \boxed{30,500}$

(3)

A - naturally long

payoff local $= P^{exp}_{local} - cost$

b- Short the futures market

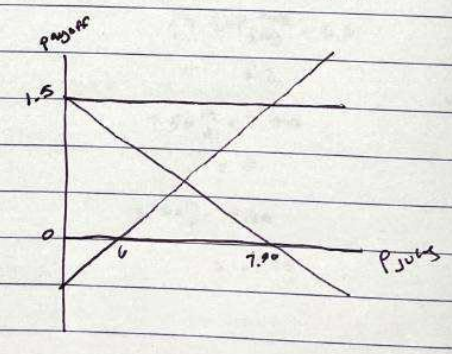
$P_{local} = P^{July}_{local} - 6$ $\quad P_{future} = P^{now}_{future} - P^{exp}_{future}$

$= 7.5 - P^{July}_{future}$

c)

| | 5.50-6 | 7.50-6 | 9.25-6 |
|---|---|---|---|
| local ~ $= P_{July} - 6$ | $= .50$ | $= 1.50$ | $= 3.25$ |
| future ~ $= 7.50 - P_{July}$ | 7.50-5 $= 2.50$ | 7.50-6 $= 1.50$ | 7.50-9.25 $= -1.75$ |

d-



e- benefits by guaranteeing a price no matter what. When P ↓ the short covers, when P↑ the local π covers. the hedging reduces variability limits big risk & reward.

(4) a- naturally short

$P_{F\,local} = Value - P_{local} = 1.50 - P_{local}^{any}$

benefit when P ↓

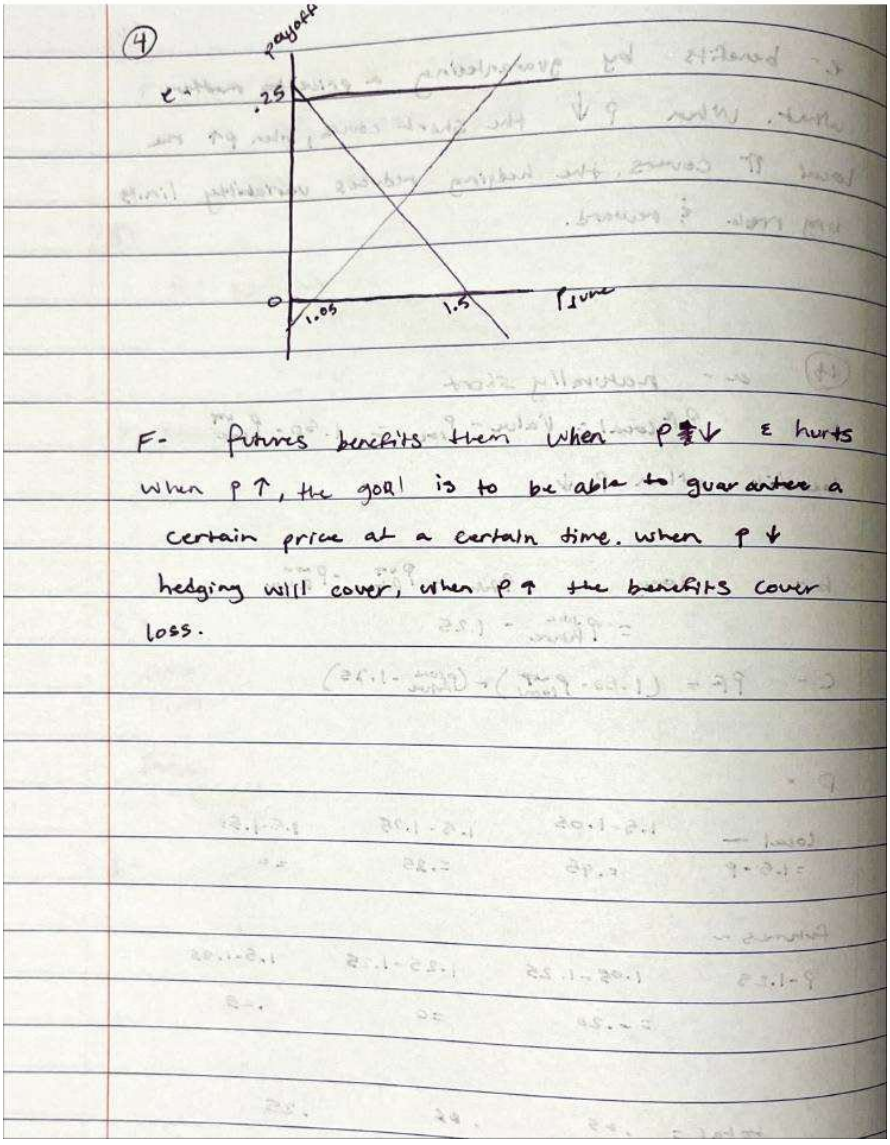
b- long $P_{Future} = P_{future}^{any} - P_{future}^{now}$

$= P_{future}^{June} - 1.25$

c- $PF = (1.50 - P_{local}^{any}) + (P_{future}^{June} - 1.25)$

D.

| local ~ | 1.5-1.05 | 1.5-1.25 | 1.5-1.50 |
|---|---|---|---|
| =1.5-P | =.45 | =.25 | =0 |
| futures ~ | | | |
| P-1.25 | 1.05-1.25 | 1.25-1.25 | 1.5-1.25 |
| | =-.20 | =0 | .25 |
| total = | .25 | .25 | .25 |




F- futures benefits them when P ↓ ε hurts when P ↑, the goal is to be able to guarantee a certain price at a certain time. when P ↓ hedging will cover, when P ↑ the benefits cover loss.

**Student 321-22 (score 3)**

# AGBE Lab #16

1. (a) You should take the long position. You can offset this by taking the short position too. You will buy in June for $1/lb and sell for $3/lb in Dec.

(b) (3-1) × 40,000 × 1

2 × 40,000 × 1 = 80,000 profit. You will profit $2/lb.

(c) To profit by $160,000, you should trade 2 contracts.

160,000 = (3-1) × 40,000 × q

160,000 = 2 × 40,000 × q

160,000 = 80,000q

80,000 / 80,000

q = 2

2. (a) You would have a bearish approach.

8 × .25 = 2 → 8 - 2 = $6/bu is the new price

(b) You would take the short approach in the short run, and the long approach later. You will sell in May for $8/bu and buy in Sept for $6/bu.

(c) (8-6) × 5,000 × 1

2 × 5,000 × 1 = 10,000 / 5,000 b = $2/bu

You would profit $2/bu.

(d) 8 × 5,000 × 5

Total value

40,000 × 5 = 200,000 × 0.15 = $30,000 = margin acct.

$.02/bu × (5 × 5,000) = $500 = commission fee

$.02/bu × 25,000 $30,500 Total

# AGBE Lab #6

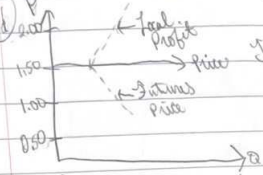
③ (a) We are naturally long in the local market as a producer.
You benefit when prices fall as a producer.
$PF_{local} = P_{local} - cost$
$\pi_{local} = P_{local} - 6$

(b) You would take the naturally short position, you would offset that by going long in the futures market.
$PF_{fut.} = P_{fut.} - P_{fut.}$ In July you would buy.

(c)

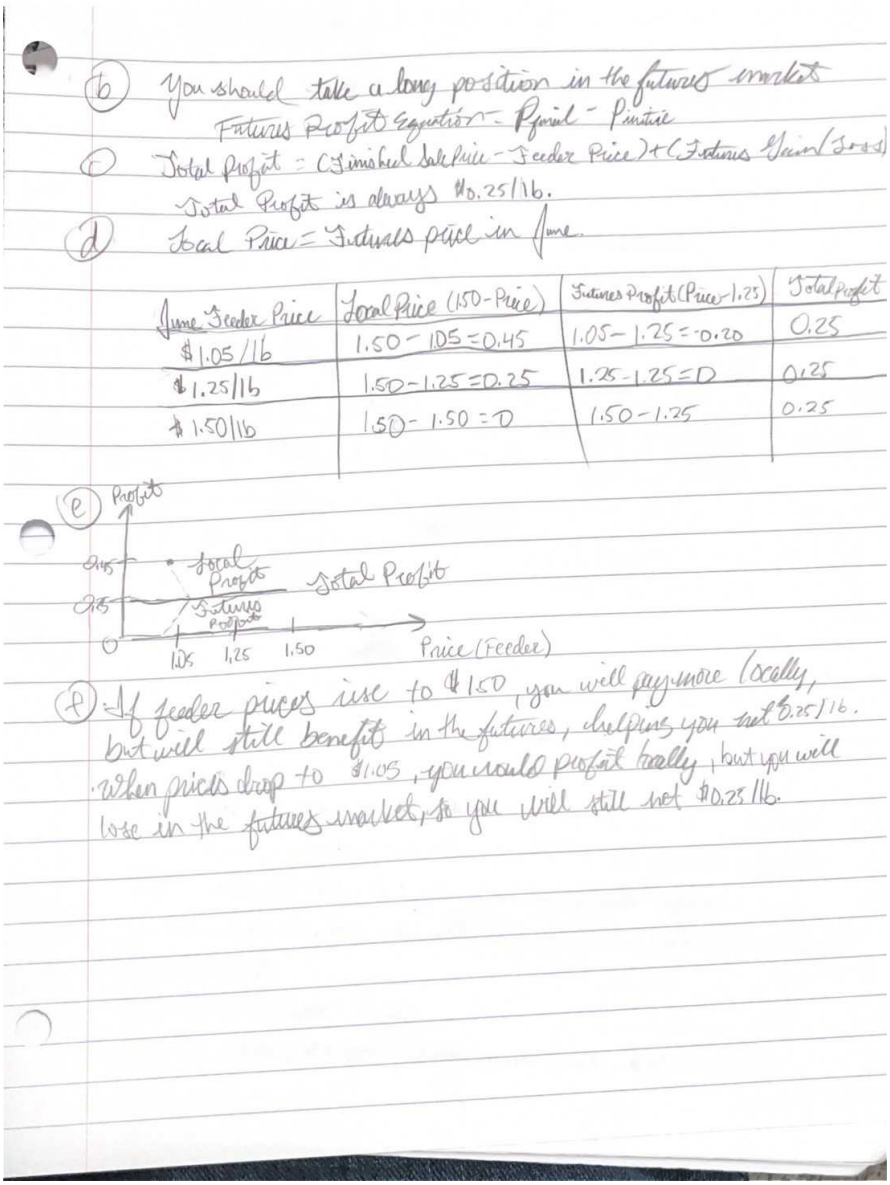
| Fut. May | Buy July | Local | Total Profit |
|---|---|---|---|
| 7.50 − 5.50 = $2/bu | | 5.50 − 6 = −0.50 | $1.50 |
| 7.50 − 7.50 = $0/bu | | 7.50 − 6 = 1.50 | $1.50 |
| 7.50 − 9.25 = $−1.75/bu | | 9.25 − 6 = 3.25 | $1.50 |

(d)




(e) · When prices are low, $5.50, at the local market you will sell what below cost losing $0.50, in the futures market you will profit $2, so you will net earn $1.50.
· When prices are high, $9.25, in the local market you will profit $3.25, but on the futures market you will lose $1.75, but you will still net $1.50.
· Hedging reduces risk, but you give up potential gains.

④ (a) in the local market, you will buy in June making you short in the local market.
Local Profit = $P_{sale} - P_{feeder}$
You benefit when prices fall because your input prices fall.




**Student 321-23 (score 4)**

Lab Exercise 6

1. Assume that you are a speculator. From a friend working in the US Senate, you found out that there is a policy in the works that will place a tax on feedlot operators. This policy will go into effect in December. You know that this policy will increase the price of fed cattle by $2. A fed cattle contract is 40,000 pounds, and the price in June is $1.00/lb. (Ignore the commission fee and margin for now.)
   a. Which position (long or short) should you take? How will you offset that position? Explain the prices you will sell and buy a contract for.
   b. How much will you profit per pound if your price expectations are correct? How much will you profit if you trade one contract?
   c. How many contracts should you buy/sell in order to profit by at least $160,000?

2. Assume that you are a speculator. The USDA comes out with a report that the soybean harvest in September will be well above expectations. Using an EDM calculation, you find that prices will decrease by 25%. One soybean contract is 5,000 bushels and the current May price is $8.00/bu.
   a. Do you have bullish or bearish price expectations? What will the soybean futures price be in September if you are correct?
   b. Which position (long or short) should you take? How will you offset that position? Explain the prices you will sell and buy a contract for.
   c. How much will you profit per bushel if your price expectations are correct? How much will you profit if you trade one contract?
   d. Assume that you trade 5 contracts. You call your broker. You need to pay a commission fee of 2 cents/bu. You also need to deposit 15% of the contract value into a margin account. How much do you need to deposit in May?

3. Suppose you are a Montana farmer growing winter wheat. You intend to sell the wheat to local elevators after it is harvested, but you don't know the price you will be quoted by the elevator at the time of sale. It costs you $6/bu to produce the wheat.
   a. Which position are you in the local market? What is your local profit equation? Do you benefit when prices rise or fall?
   b. What position would you take in the futures market to offset local price variability risk? Suppose that in May you take a position on a July futures contract that is priced at $7.50/bu. What is your futures market profit equation? Explain what you would do in July just before the contract expires.
   c. Assume that the futures and local prices converge (are exactly the same in July). Given that you took a May-July futures contract priced at $7.50, calculate your per bushel profits in the local and in the futures markets if the price in July was one of the following: $5.50, $7.50, $9.25.
   d. Graph your local payoff, futures payoff, and total payoff.
   e. Discuss how the farmer benefits from hedging. Specifically, discuss the local, future, and overall payoffs when prices are low. Then, discuss the hedging tradeoffs that occur when prices are high (these are called hedging losses). Does hedging maximize profits or reduce profit variability?

4. You are a feedlot operator. You will need to purchase feeder cattle in June, and you will do so on the local market at the going price. Suppose you know that you can sell the finished cattle at $1.50/lb. But, you want to offset any price risk using the futures market. It is currently October. Suppose the current futures contract price for feeder cattle is $1.25/lb.
   a. Which position are you in the local market for feeder cattle? What is your local profit equation? Do you benefit when prices rise or fall?
   b. Which position should you take in the futures market to offset the price risk? What is your futures market profit equation?
   c. What is the total payoff if you implement a hedging strategy?
   d. Construct a table that illustrates your per pound payoff if the June price is one of the following: $1.05/lb, $1.25/lb, and $1.50/lb. Assume that the local and futures price in June is the same.
   e. Graph your local payoff, futures payoff, and total payoff.
   f. Discuss the benefits and costs of hedging for the feedlot operator. When does participating in the future market benefit their payoffs? When does participating in the futures market hurt their benefits? What is the goal of hedging?

buy for a dollar now in June and sell for $3/lb. in Dec. meaning that you would make a profit of $2/lb. In order to offset this, you would buy in June at $1/lb then sell in Dec. for $3/lb.

1b. $\text{Profit} = (\$3/\text{lb} - \$1/\text{lb}) \times 40{,}000 \times 1$

$\text{Profit} = 80{,}000$

Per pound we would profit $2. Per contract we would profit $80,000 if we traded.

1c. In order for you to profit $160,000, you would need to sell 2 contracts.

2a. You have a berish price expectation. The future soybean prices would be $6/bu in September if you are correct.

2b. You would take a short position. You would offset this by selling a contract now at $8/bu and buy it back later at $6/bu.

Profit = +10,000

2d. $25{,}000 \times 0.02 = \$500$ ← commission fee

$0.15 \times 5 \times 5{,}000 \times 8.00 = \$30{,}000$ ← you need to deposit this in May

3a. You are naturally long in the local market.

$$\text{Payoff}_{\text{local}} = P^{\text{expiration}}_{\text{local}} - C(\$6)$$

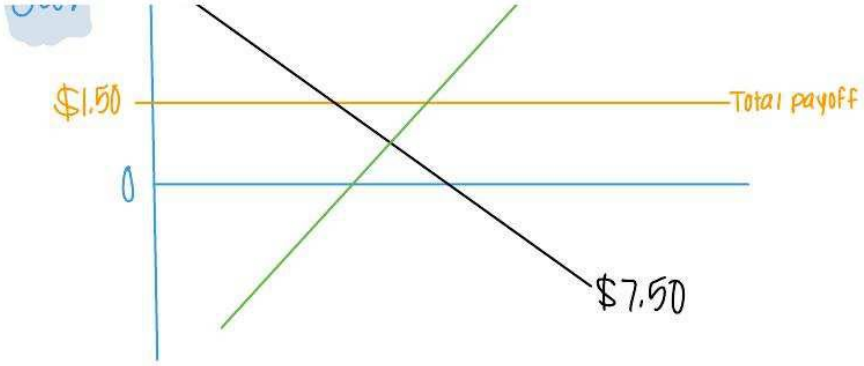
You benefit when the prices rise.

3b. To offset this local price variability risk, you would take a short position.

$$\text{Payoff futures} = P^{(\text{May})\ \text{now}}_{\text{futures}} - P^{(\text{July})\ \text{expiration}}_{\text{futures}} = 7.50 - P^{\text{July}}$$

3c.

| price in July | \$5.50/bu | \$7.50/bu | \$9.25/bu |
|---|---|---|---|
| local market payoff ($P^{\text{July}}_{\text{local}} - \$6/\text{bu}$) | $5.50 - 6 = -\$0.50$ | $7.50 - 6 = \$1.50$ | $9.25 - 6 = \$3.25$ |
| Futures market payoff ($7.50/\text{bu} - P^{\text{July}}_{\text{futures}}$) | $7.50 - 5.50 = \$2.00$ | $7.50 - 7.50 = \$0$ | $7.50 - 9.25 = -\$1.75$ |
| Total per bushel | \$1.50 | \$1.50 | \$1.50 |




3c. When prices are low, hedging offsets cash loss. When prices are high, hedging still looses by giving up the extra profit you would have received. Hedging does not maximize profit but it reduces profit variability.

4a. You are naturally short. $Payoff_{local} = Value - P^{expiration}_{local}$ You benefit when the prices fall.

4b. You are naturally short and go long in the futures market to offset the price risk.

$Payoff_{futures} = P^{expiration}_{futures} - P^{now}_{futures}$

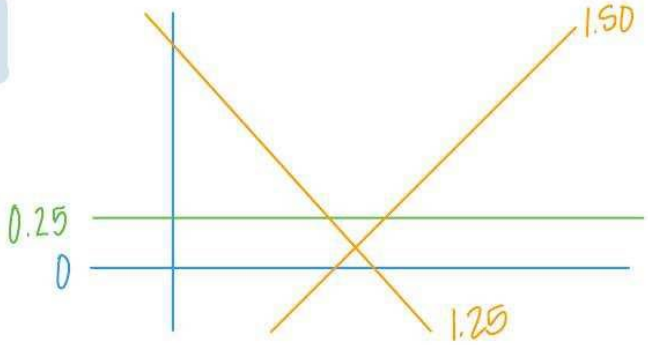
overall ( local ) + ( futures ) + ( futures )

$= (1.50 - P_{June}) + (P_{June} - 1.25)$

4d.

| prices in June | $1.05/lb | $1.25/lb | $1.50/lb |
|---|---|---|---|
| Local market payoff $1.50 - P_{June}$ | $1.50 - 1.05 = 0.45$ | $1.50 - 1.25 = 0.25$ | $1.50 - 1.50 = 0$ |
| Futures market payoff $P_{June} - 1.25$ | $1.05 - 1.25 = -0.20$ | $1.25 - 1.25 = 0$ | $1.50 - 1.25 = 0.25$ |
| Total | 0.25 | 0.25 | 0.25 |

4e.



help reduce profit variability which locks you in at 0.25/lb. The costs of hedging as a feedlot operator means that if prices drop in the future, you lose extra profit.

**Student 321-24 (score 3)**

# Lab Exercise 6.

1a. Take a long position and offset with short contract
buy: June => $1 , sell: Futures => $3

b. 40,000 ($1)
40,000 ($3)
=> 40,000 ($2) = $80,000 ¢ per lb = $2

c. 160,000 = (3-1) 40,000 * n
n = 2

2a. - Bearish price expectation
$8 (.75) = $6 in September

b. Sell in May at $8.00, buy in September at $6.60.

c. (8-6) 5,000 * 1 = $10,000 or $2 per bushel

d. 5,000 (5) = 25,000
=> 25,000 (.02) = 500
Commision fee = 500
Contract q = 25,000
25,000 ($) = 200000
=> 200000 (.15) = 30,000
Margin = 30,000
- Deposit $30,500 in May

3a. Naturally Long, $\text{Payoff}_{\text{Local}} = P_{\text{local}}^{\text{expiration}} - 6.00$, benefit when prices rise

b. take short position to offset

$\text{Payoff}_{\text{future}} = 7.50 - P_{\text{July}}$

In July, you offset your futures short position by taking a futures long position.

c.

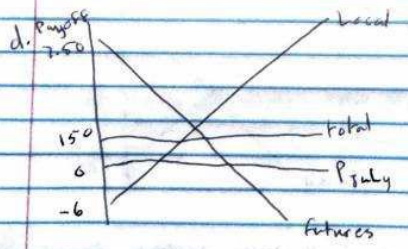
| Payoff Futures | Payoff Local |
|---|---|
| 7.50 - 5.50 = $2 | 5.50 - 6 = $ -0.50 |
| 7.50 - 7.50 = $0 | 7.50 - 6 = $ 1.50 |
| 7.50 - 9.25 = $1.75 | 9.25 - 6 = $ 3.25 |

2 + (-0.50) = $1.50

0 + 1.50 = $ 1.50

-1.75 + 3.25 = $1.50

d.




e. Farmers like hedging because it ensures stability. They might lose money locally but they gain in futures. Same applies vise-versa.

4a. buying in local = naturally short

$Payoff_{local} = Value - P^{expiration}_{local}$
(1.50/lb)

b. take long position in futures

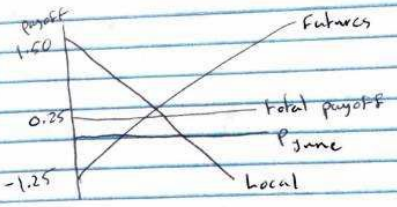
$Payoff_{futures} = P^{expiration}_{futures} - 1.25$

c. overall payoff = $(1.50 - P^{June}_{local}) + (P^{June}_{futures} - 1.25)$

d.

| $P_{June}$ | 1.05/lb | 1.25/lb | 1.50/lb |
|---|---|---|---|
| Local | 0.45 | 0.25 | 0 |
| futures | −0.20 | 0 | 0.25 |
| overall π | 0.25 | 0.25 | 0.25 |

e.




f. Feedlot operators benefit from hedging when local prices are low. They hurt when local prices are high. The purpose of hedging is profit stability.

**Student 321-25 (score 3)**

1.) $P^{Pr}_{Feedcattle} = 3$ $P^{F}_{Feedcattle} = 1$ Contract size = 40,000

a.) go long, to offset buy short, you will buy at 1 sell at 0

b.) $\Pi = 1 \times 40{,}000 \times 3 = 120{,}000$

c.) $\frac{160{,}000}{120{,}000} = 1.3$

2.)

a.) breakeven $8(1-0.05) = 8.00$ bu

b.) Take short, offset by buying futures at 6.00
today: sell for 8
Sep: buy for 6

c.) buyers
$8 - 6 = 2$ · Contract = 5,000 = 10,000

0.02 for x 2 = 0.04 bushel

Net Profit earned = $2.00 - 0.04 = 1.96$
net profit per contract = $1.96 \times 5{,}000 = 9{,}800$

d.)
Contract Value (today)
$8.00 \times 5{,}000 = 40{,}000$

Margin per contract (15%) = $0.15 \times 40{,}000 = 6{,}000$
Total Margin 5 contracts = $6{,}000 \times 5 = 30{,}000$

3.)

a.) Competitive Producer, Local Profit = $P_{Local} - 6$
Benefit when prices rise

B.) To offset price take the short sell futures in May

$\Pi = 7.50 - F_t$

In July offset the short by buying the same Futures contract

| July price | Local Profit | Futures Profit | TP |
|---|---|---|---|
| 5.50 | 5.50-6=-.50 | 7.50-5.50=2.00 | 1.50 |
| 7.50 | 7.50-6=1.50 | 7.50-7.50=0.00 | 1.50 |
| 9.25 | 9.25-6=3.25 | 7.50-9.25=-1.75 | 1.50 |

D.)

E.) Co can protect short futures position against the appreciation of the Euro.

If Co switches entirely over to hedging, the farmer forfeits the possibility of local revenue by locking in the short futures position. Switching the hedging cost. Hedging removes volatility from both local and profit.

F.i)

a.) They should take the short position (buyer)

$\Pi_{local} =$

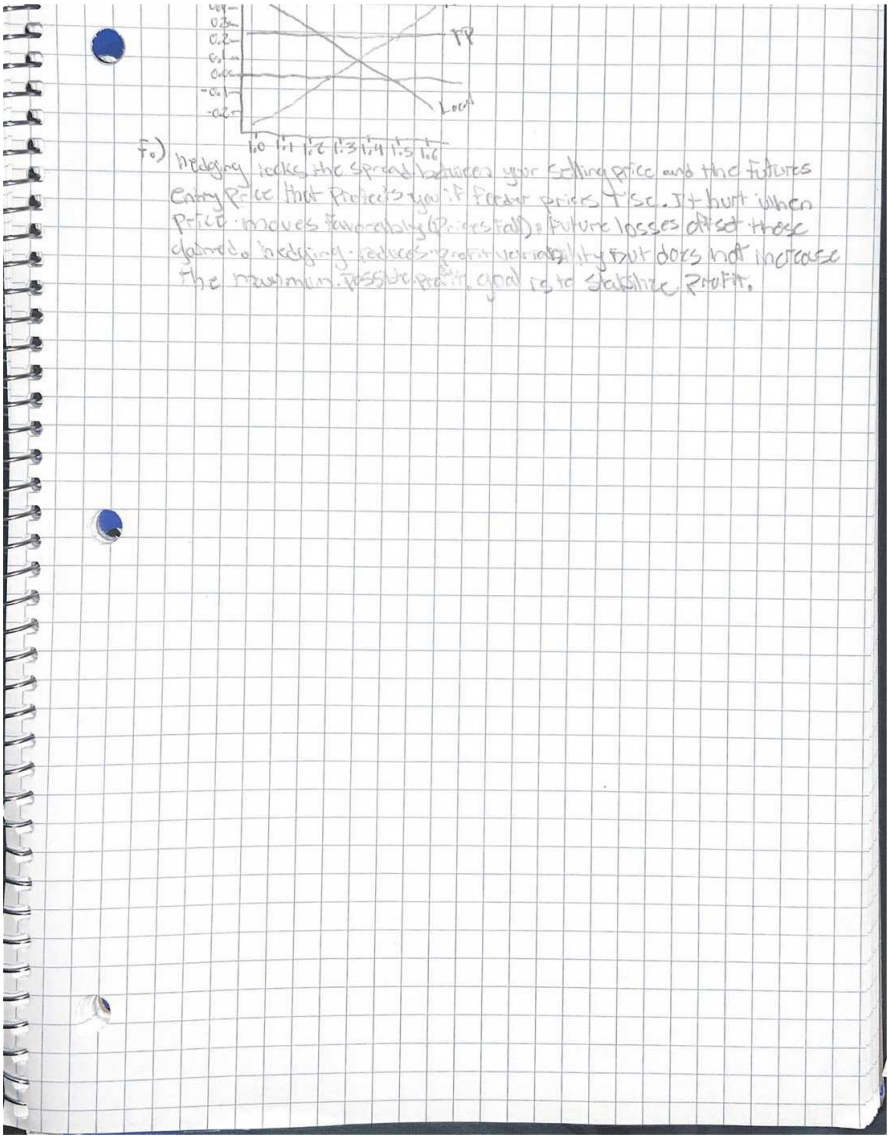
b.) To offset future hedge futures position

$\Pi_{future} = P - 1.25$

c.) $\Pi_{total} = (1.50 + P) + (P - 1.25) = 1.50 + 1.25 = 0.25$/lb

d.)

| Jun $ P | local Profit | Future Profit | Total |
|---|---|---|---|
| 1.00 | 1.50+1.05=0.45 | 1.05-1.25=-.20 | 0.25 |
| 1.25 | 1.50-1.25=0.25 | 1.25+1.25=0 | 0.25 |
| 1.50 | 1.50-1.50=0 | 1.50-1.25=.25 | 0.25 |




f.) Hedging locks the spread between your selling price and the futures carry price that protects you if Present price $ is ↓. It hurt when price moves favorably (Prices rise), future losses offset those gained. Hedging reduces profit variability but does not increase the maximum profit. The goal is to stabilize profit.

**Student 321-26 (score 4)**

1.) a- You should take a long position. To offset that position, you take a short position in the future.
- You buy the contract in June for $1 and sell in December for $3.

b- $\pi = (3-1) \times 1 \times 40{,}000 = 80{,}000$

$80{,}000 / 40{,}000 = \$2$ profit per pound

c- $\pi = (3-1) \times (?) \times 40{,}000 = 160{,}000$

$? = 2$

- You should buy 2 contracts to profit $160,000.

2.) a- You have bearish expectations.

$8 \times .25 = 2$ $\quad 8 - 2 = 6$

- Soybeans future price is $6

b- You should take a short position. To offset that position, you will take a long position and sell later.
- You will buy the contract in May for $8 and sell in September for $6.

c- $(8-6) \times 5{,}000 \times 1 = 10{,}000$

If you trade one contract you make $10,000

d- $5000 \times 5 = 25{,}000$

$\Rightarrow 25{,}000 \times .02 = 500$

$5 \times 5{,}000 \times 8 = 200{,}000$

$\Rightarrow 200{,}000 \times .15 = 30{,}000$

$= 30{,}000 + 500 = 30{,}500$

•In May you need to deposit $30,500

3.) a- In the local market you are naturally long

Eqn: Payoff local $= P^{July}_{local} - \$0$

You benefit when prices rise ↑

b- In May futures you take a short position

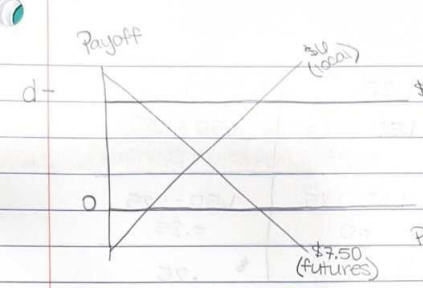
Eqn: Payoff futures $= 7.5P^{May}_{July} - P^{July}_{July}$

In July before the contract expires you would buy a long futures contract

c-

| Price July | $5.50 | $7.50 | $9.25 |
|---|---|---|---|
| Local market payoff | 5.5 - 0 | 7.5 - 0 | 9.25 - 0 |
| $P^{July}_{local} - 0$ | = -0.5 | = 1.5 | 3.25 |
| Futures market payoff | 7.5 - 5.5 | 7.5 - 7.5 | 7.5 - 9.25 |
| $7.5P^{May}_{July} - P^{July}_{July}$ | = 2 | = 0 | = -1.75 |
| Total per barrel | $1.50 | $1.50 | $1.50 |

d-

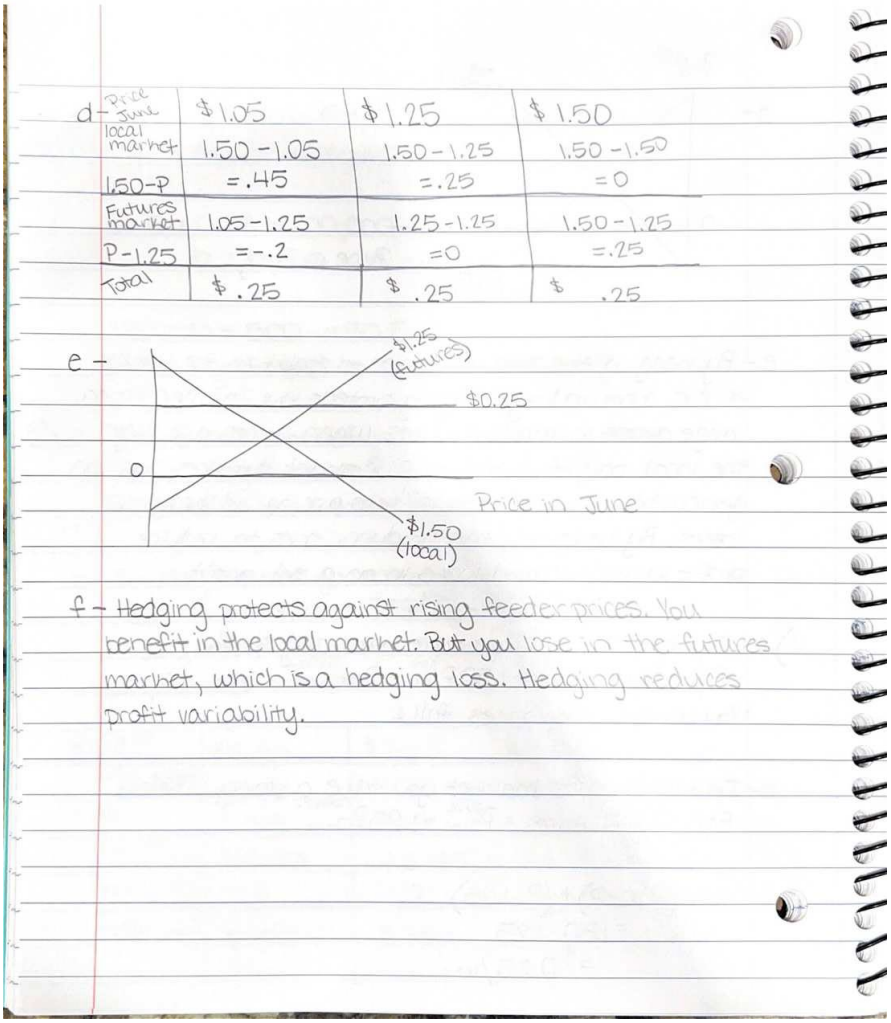



e- By hedging the producer tries to stabilize the prices of the commodity. Hedging protects the farmer from large drops in market prices. When prices are high the local payoff is higher. The short futures position generates a loss. These offsets are called hedging losses. By hedging, the producer tries to reduce profit variability and locks in on a set profit.

4.) a- In the local market you are naturally short.
Eqn: Payoff local = $1.50 P^{June}_{local} - P_{cost\ June}$
- You benefit when prices fall ↓

b- In the futures market you take a long position.
Eqn: Payoff futures = $P^{June}_{June} - 1.25 P^{October}_{June}$

c- $\pi = (1.50 - P) + (P - 1.25)$
$= 1.50 - 1.25$
$= \$0.25/lb$



d –

| Price June | $1.05 | $1.25 | $1.50 |
|---|---|---|---|
| local market | 1.50 – 1.05 | 1.50 – 1.25 | 1.50 – 1.50 |
| 1.50 – P | = .45 | = .25 | = 0 |
| Futures market | 1.05 – 1.25 | 1.25 – 1.25 | 1.50 – 1.25 |
| P – 1.25 | = –.2 | = 0 | = .25 |
| Total | $ .25 | $ .25 | $ .25 |

e –



f – Hedging protects against rising feeder prices. You benefit in the local market. But you lose in the futures market, which is a hedging loss. Hedging reduces profit variability.

**Student 321-27 (score 3)**

1a. Take a long position as the prices will increase in the future. To offset taking a long position we would sell a contract. We would buy a contract for $1 and then sell in december at $3.

1b. Profit = (Selling price - purchase price) · contract size · # of contracts

= (3 - 1) · 40,000 · 1

= $80,000 per contract

profit per pound would be $ 2 cause of the increase in dec.

1c. You would sell 2 contracts to profit at least $160,000

2a. You have a bearish price expectation. The futures price should be $ 6 in September.

2b. Take a short position. You offset this by buying contract We would sell a contract for $ 8 and hope to buy later at $6 a bushel

2c. Profit = (selling - buying) · contract size · # of contracts

160,000 = (8-6) · 5,000 · 1

= 10,000

2d. commission fee = 0.02 · (5 · 5,000) = $500

deposit into margin account = 15% · 5 · 5,000 · 8 = $ 30,000

3a. My position in the local market is naturally long. Our profit equation is $Payoff_{local} = P_{local}^{expiration} - cost$. We would benefit if the prices rise.

3b. You would take a short position in a futures market.

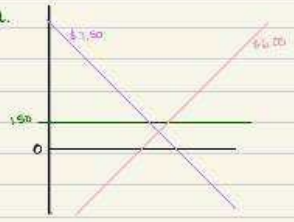
$Payoff_{futures} = P_{futures}^{now} - P_{futures}^{expiration}$

$= 7.50 - P_{futures}^{expiration}$

3c.

| price in July | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| local market payoff $P^{sale}_{local} - 6.00$ | 5.50 - 6.00 = -0.50 | 7.50 - 6.00 = +1.50 | 9.25 - 6.00 = +3.25 |
| Futures market payoff $7.00 - P^{sale}_{futures}$ | 7.00 - 5.50 = +1.00 | 7.00 - 7.00 = +0 | 7.00 - 9.25 = -2.25 |
| total business | $1.50 | $1.50 | $1.00 |

3d.




3e. For the farmer hedging helps reduce profit variability. However in a futures market if prices rise the farmer will face losses.

4a. In a local market for feeder cattle your in a naturally short position

$$Payoff_{local} = Value - P^{expectation}_{local}$$

The buyer benefits when prices decrease in the local market but is worse off when prices increase.

4b. To offset in the futures market you would take a long position

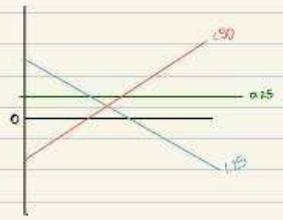
$$Payoff_{futures} = P^{expiration}_{futures} - P^{now}_{futures}$$

4c. $$PF_{overall} = \left(Value - P^{expectation}_{local}\right) + \left(P^{expiration}_{futures} - P^{now}_{futures}\right)$$

4d.

| price in June | $1.05 | $1.25 | $1.50 |
|---|---|---|---|
| local market payoff $1.50 - P_June | 1.50 - 1.05 = 0.45 | 1.50 - 1.25 = 0.25 | 1.50 - 1.50 = 0 |
| futures market payoff P_futures - 1.25 | 1.05 - 1.25 = -0.2 | 1.25 - 1.25 = 0 | 1.50 - 1.25 = 0.25 |
| total payoffs | $0.25 | $0.25 | $0.25 |

4e.




4f. As a feedlot operator when hedging is involved it helps reduce profit variability & locks you in at 0.25 per lb. However in a futures market if theres a decrease in price then you'll lose profit

**Student 321-28 (score 3)**

# Lab Exercise 6

Ava Palmberg

1. Long Position because you have a bullish outlook. You expect the price to go up so you want to buy now and sell at a higher price.

b. $\pi$ = (selling price - purchase price) × size × # of contracts
(3-1) × 40,000 × 1 = $80,000 80,000/40000 = 2

c. $160,000 = (3+1) × 40,000 × 2 = $160,000
you should sell 2 contracts or more

2. a. you have bearish price expectations. The price will be 8(.25) = $6.00

b. you should take a short position. You will sell now for $8 in hopes to buy later at $6.00.

c. $\pi$ = (8-6) × 5000 × 1 = $10,000 $2 per bushel

d. Commission .02 x 25,000 = $500
Margin 15% × 5 × 5000 × 8 = $30,000
22,500 + 500 = $30,500

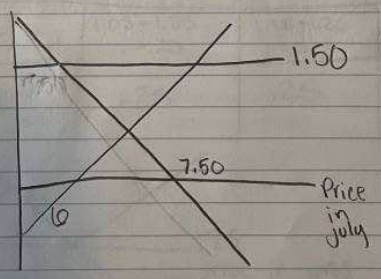
3. A: producers = Naturally long. We benefit when the price rises in the local market.
payoff local = $P_{local}^{expectation}$ - Cost

B. You would take a short position to offset.
Payoff futures = $P_{futures}^{our}$ - $P_{futures}^{expectation}$
In July we will buy our contract in hopes to buy one at a lower price

C.

| P in July | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| local Profit P-6 | 5.50-6 = -.50 | 7.50-6 = 1.50 | 9.25-6 = 3.25 |
| Future Profit 7.50-P | 7.50-5.50 = 2 | 7.50-7.50 = 0 | 7.50-9.25 = -1.75 |
| Total | 2+-.50 = 1.50 | 1.50+0 1.50 | 3.25-1.75 = 1.50 |

d.



c. When prices are low, farmers benefit from hedging because it gives them money during bad times in the local market and dont benefit in the futures market. When prices are low the benefit in futures and not local. Overall they are the same. Hedging reduces profet variability.

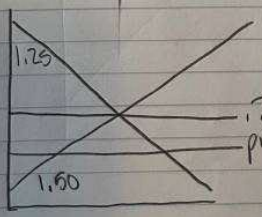
4. a. short position in the local market.
$Payoff_{local} = Value - P_{local}^{expiration}$
We benefit when prices decrease.

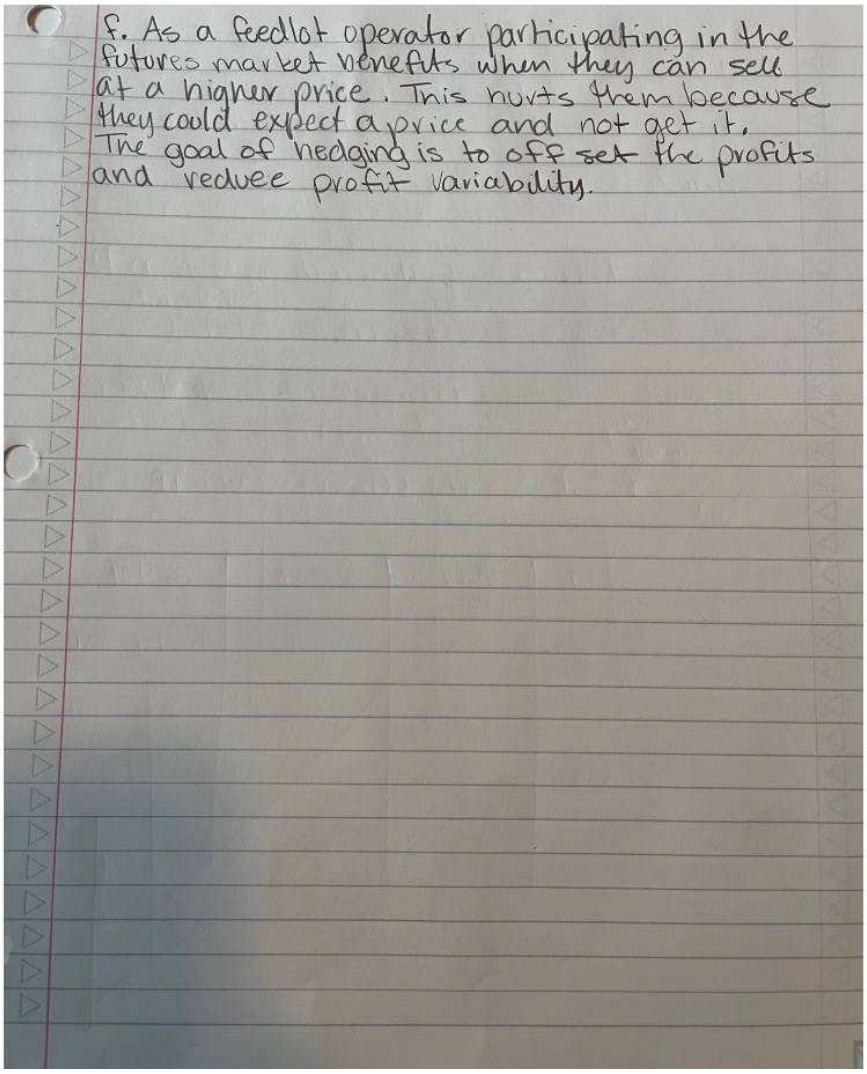
b. In the futures market we will go long to offset $Payoff_{futures} = P_{futures}^{expiration} - P_{futures}^{now}$

c. $\pi = (1.50 - P_{local}^{expiration}) + (P_{future}^{expiration} - 1.25)$

D

| Future | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| $1.50 - P_{local}$ | 1.50 - 1.05 = .45 | 1.50 - 1.25 = .25 | 1.50 - 1.50 = 0 |
| $P_{future} - 1.25$ | 1.05 - 1.25 = -.20 | 1.25 - 1.25 = 0 | = .25 |
| Total | .25 | .25 | .25 |






**Student 321-29 (score 3)**

Alex Pelfresne
Lab Exercise 6

1a. I would take a long position in this contract because if I expect a price increase, I can buy a contract now at a price of 1 dollar and sell later for 3 dollars.

1b. Profit = $(3-1) * 40000 = 80000$

Profit per pound = $3-1 = \$2$

Profit per pound = $2
Total Profit for one contract = $80000

1c. Profit = $160000 = (3-1) * 80000 = 160000$
or $(3-1) * 40000 * 2 = 160000$

2 contracts

2a. My expectations for prices are bearish because the price is expected to go down. My expected price is $6 per bushel in september due to the 25% decrease from $8.

2b. I would take a short position in this contract because with the price decrease that is expected, I would want to sell the contract ~~now before the price goes down~~ later at the current price before the price goes down.

2c. Profit per Bushel = $2
Profit per one contract = $(8-6) * 5000 * 1 = 10000$

Alex Pelfresne
Lab Exercise 6

2d. $0.02 * 25000 = \$500$

$5 * 5000 * 8 = 200000 * .15 = 30000$

$30000 + 500 = 30500$

deposit = $30500

3a. I am in a naturally long position in the open market because I am producing the commodity.

Local Profit Equation = $Payoff_{local} = P^{expiration}_{local} - Cost$

As a producer, I benefit when prices rise.

3b. I would take a short position in the futures market to offset the naturally long position I am in the local market.

Futures Market Profit Equation

→ $Payoff_{futures} = P^{now}_{futures} - P^{expiration}_{futures}$

Before the contract expires, I would sell my current contract in the futures market.

Lab Exercise 6

3c. $Profit_{total} = Profit_{local} + Profit_{futures}$

At 5.50 per bushel

Profit = $(5.50 - 6) + (7.50 - 5.50) = -0.5 + 2 = 1.5$

Profit at \$5.50 = \$1.5

At \$7.50 per bushel

Profit = $(7.50 - 6) + (7.50 - 7.50)$
$1.5 + 0 = \$1.5$

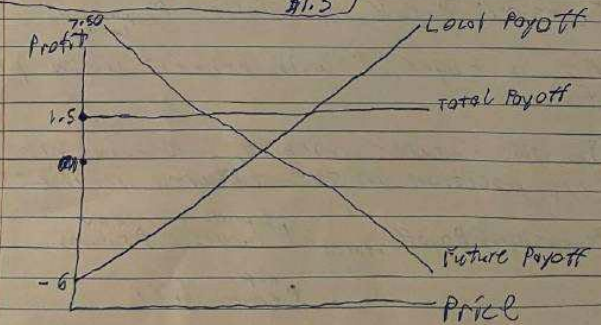
Profit at \$7.50 = \$1.5

At \$9.25 per bushel

Profit = $(9.25 - 6) + (7.50 - 9.25)$
$3.25 + (-1.75) = \$1.5$

Profit at \$9.25 = \$1.5

3d.



Alex Poltresne
Lab Exercise 6

3e. Farmers can ~~[illegible]~~ benefit from hedging by reducing their risk of lost profit in the market when prices are volitile. It helps guarentee some profit to farmers when markets are bad but also means that farmers cannot gain more profit in the market if prices are found to be more favorable to them due to the reduced profit variability that farmers have with hedging. When prices are low, local payoffs are at their lowest and future payoffs are at their highest. It is the oppisite when prices are high, where future payoffs are at their lowest and local payoffs are ~~[illegible]~~ at their highest. Due to local and future markets moving in oppisite directions, the total payoff at both low and high prices is similar in net value due to the counter acting forces in the two markets.

4a I am in a naturally short position in the local market.

Equasion: $Payoff_{local} = Value - P^{Expiration}_{local}$

$1.5 - P^{exp}_{local}$

As a buyer, I will benefit when prices fall.

4b. In the futures market, I would take a long position in the futures market.

Equasion: $Payoff_{futures} = P^{Expiration}_{futures} - P^{now}_{Futures}$

$P^{exp}_{future} - 1.25$

Lab Exercise 6

4c. Overall Payoff $= \left(\text{Value} - P^{\text{expiration}}_{\text{local}}\right) + \left(P^{\text{expiration}}_{\text{futures}} - P^{\text{new}}_{\text{futures}}\right)$

or

$= \left(\text{value} - P^{\text{new}}_{\text{futures}}\right) + \left(P^{\text{expiration}}_{\text{futures}} - P^{\text{expiration}}_{\text{local}}\right)$

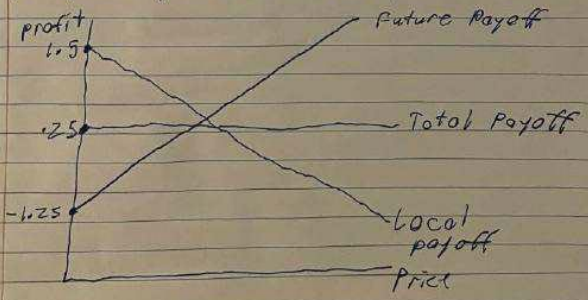
$$\text{overall payoff} = \left(1.50 - P^{\text{exp}}_{\text{local}}\right) + \left(P^{\text{exp}}_{\text{future}} - \$1.25\right)$$

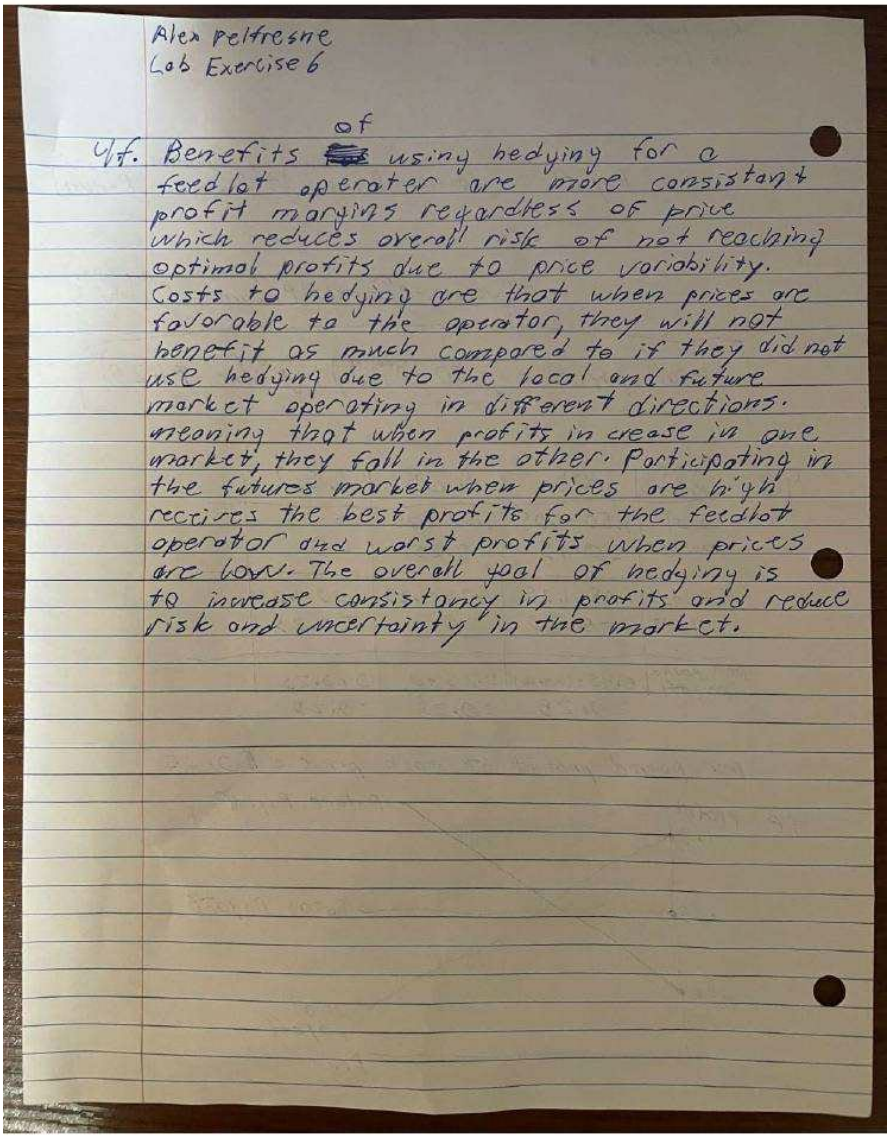
4d

| June Price | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| local market | 1.50 − 1.05 = 0.45 | 1.50 − 1.25 = 0.25 | 1.5 − 1.5 = 0 |
| futures market | 1.05 − 1.25 = −0.20 | 1.25 − 1.25 = 0 | 1.50 − 1.25 = 0.25 |
| per pound payoff | 0.45 + (−0.20) = 0.25 | 0.25 + 0 = 0.25 | 0 + 0.25 = 0.25 |

per pound profit at each price = $0.25

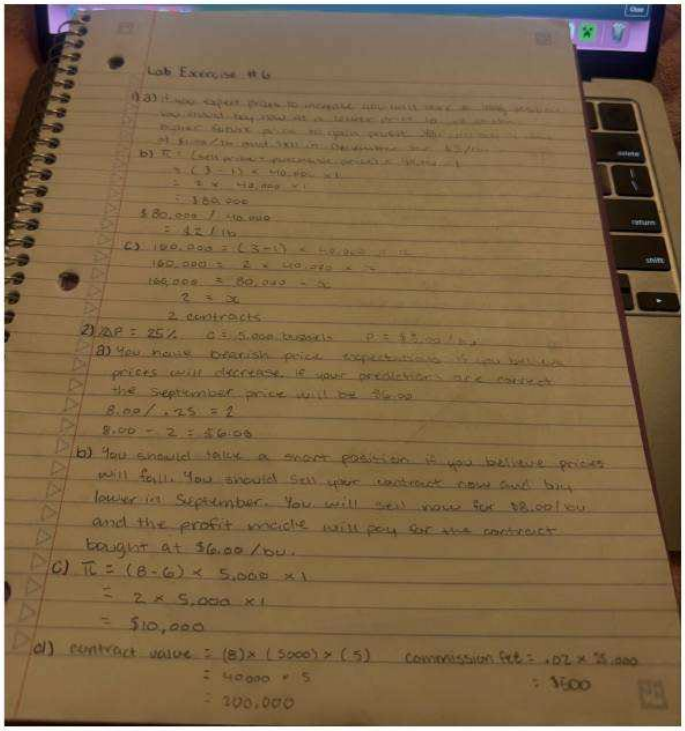
4e




Alex Peltresne
Lab Exercise 6

of
4f. Benefits ~~of~~ using hedging for a feedlot operater are more consistant profit margins regardless of price which reduces overall risk of not reaching optimal profits due to price variability. Costs to hedging are that when prices are favorable to the operator, they will not benefit as much compared to if they did not use hedging due to the local and future market operating in different directions. meaning that when profits increase in one market, they fall in the other. Participating in the futures market when prices are high receives the best profits for the feedlot operator and worst profits when prices are low. The overall goal of hedging is to increase consistancy in profits and reduce risk and uncertainty in the market.

**Student 321-30 (score 3)**



Lab Exercise #6

1) a) If you expect prices to increase you will take a long position. You should buy now at a lower price to sell later at a higher future price. If $3.00/lb and $4.50/lb. Determine your profit.

b) π = (sell price - purchase price) × (units) × (contracts)
= (3 - 1) × 40,000 × 1
= 2 × 40,000 × 1
= 80,000

$80,000 / 40,000
= $2 / lb

c) 160,000 = (3-1) × 40,000 × x
160,000 = 2 × 40,000 × x
160,000 = 80,000 x
2 = x
2 contracts

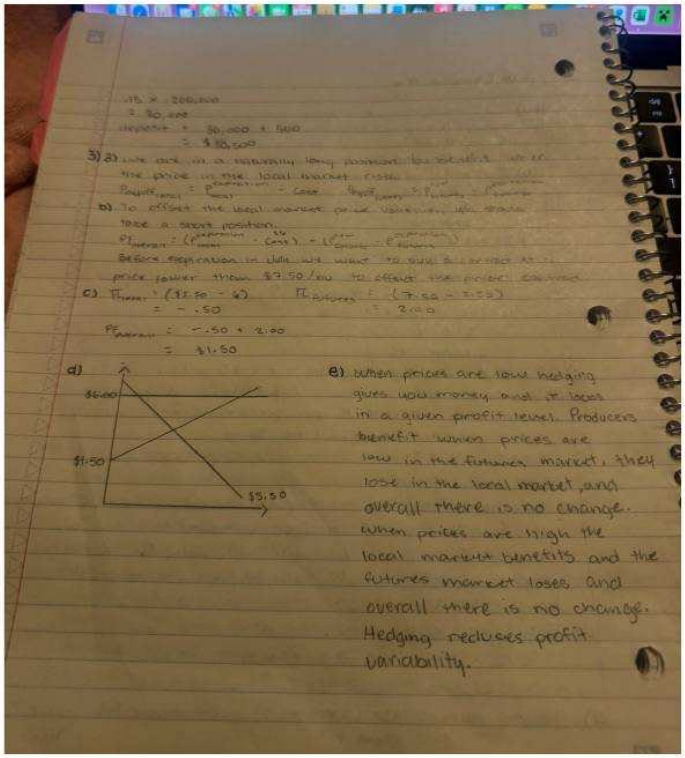
2) ΔP = 25% Q = 5,000 bushels P = $8.00/bu

a) You have bearish price expectations if you believe prices will decrease. If your predictions are correct the September price will be $6.00
8.00 / .25 = 2
8.00 - 2 = $6.00

b) You should take a short position if you believe prices will fall. You should sell your contract now and buy later in September. You will sell your for $8.00/bu and the profit oracle will pay for the contract bought at $6.00/bu.

c) π = (8-6) × 5,000 × 1
= 2 × 5,000 × 1
= $10,000

d) contract value = (8) × (5000) × (5) commission fee = .02 × 5,000
= 40000 × 5 = $100
= 200,000



.15 × 200,000
= 30,000
Profit = 30,000 × 500
= $15,000

3) a) We are in a naturally long position because we are the price in the local market rises.

$Profit_{local} = P^{current}_{local} - Cost$ $Profit_{futures} = P_{futures} - P^{current}_{futures}$

b) To offset the local market price variation, we should take a short position.

$PL_{hedge} = (P^{current}_{local} - Cost) - (P^{current}_{futures} - P^{current}_{futures})$

Before hedging in July we want to sell a bushel at a price lower than $7.50/bu to offset the price change.

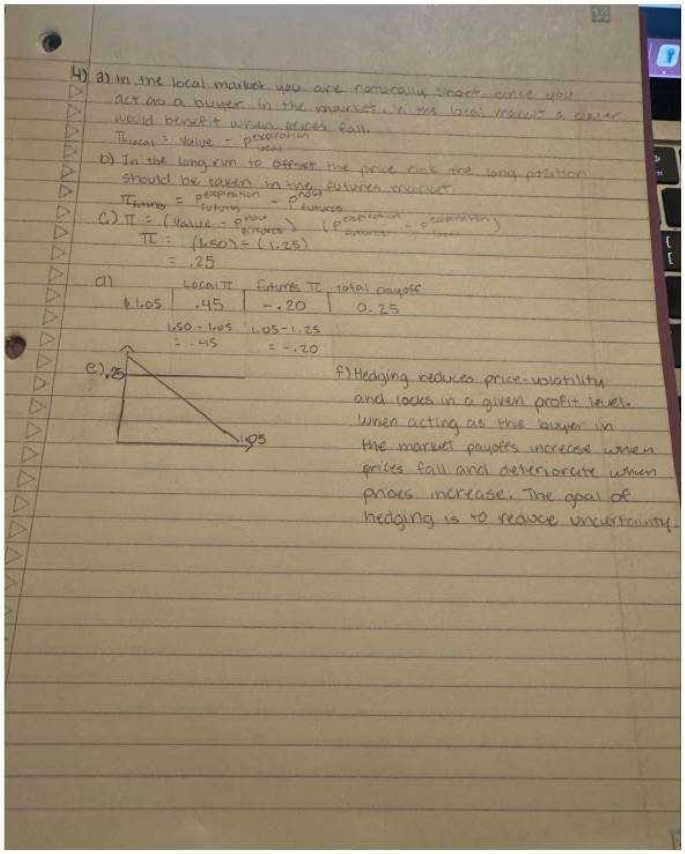
c) $\Pi_{local} = (7.50 - 8)$ $\Pi_{futures} = (7.50 - 5.50)$
$= -.50$ $= 2.00$

$PL_{hedge} = -.50 + 2.00$
$= \$1.50$

d)




e) When prices are low hedging gives you money and it loses in a given profit level. Producers benefit when prices are low in the futures market, they lose in the local market, and overall there is no change. When prices are high the local market benefits and the futures market loses, and overall there is no change. Hedging reduces profit variability.




**Student 321-31 (score 3)**

① a) long, go short to offset. Buying at June price of $1.00/lb and selling @ future price of $3.00/lb

b) profit/lb = $2 total profit = $80000

profit = (selling price - purchase price) × contract size × number of contracts

= (3 - 1) × 40,000 × 1 = $80,000

c) 160,000 = (3-1) × 40,000 × n

4 = 2n n = 2 2 contracts

② a) bearish. $8.00/bu × 0.75 = $6.00/bu

b) short, go long to offset. selling @ may pricing, buying @ sept. selling @ $8.00/bu, buying in Sept @ $6.00/bu

c) profit = (selling price - purchase price) × C size × # C

= (8-6) × 5000 × 1 $2.00/bu profit, total = $10,000

= $10,000

d) profit 5,000 × 5 = 25000 × 0.02 = 500 = commission

contract value = 8 × 25,000 = $200,000 × 0.15 = 30,000

$30,500 = deposit

③ a) naturally long, profit eqt: $Payoff_{local} = P_{local}^{expiration} - Cost$ ↓ $6.00/bu

benefit when prices rise

b) take short to offset.

$Payoff_{futures} = P_{futures}^{now} - P_{futures}^{expiration} = P_{may} - P_{July} = \$7.50/bu - P_{July}$

would offset again & go long (sell another contract)

c) $Payoff_{futures} = \$7.50 - \$5.50 = \$2$ $2 + (-0.5) = \$1.50$

$\$7.50 - \$7.50 = \$0$ $0 + 1.50 = \$1.50$

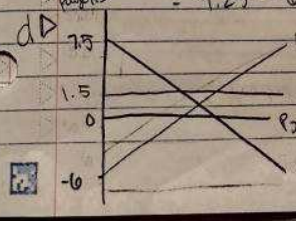
$\$7.50 - \$9.25 = -\$1.75$ $-1.75 + 3.25 = \$1.50$

$Payoff_{local} = \$5.50 - \$6 = -\$0.50$

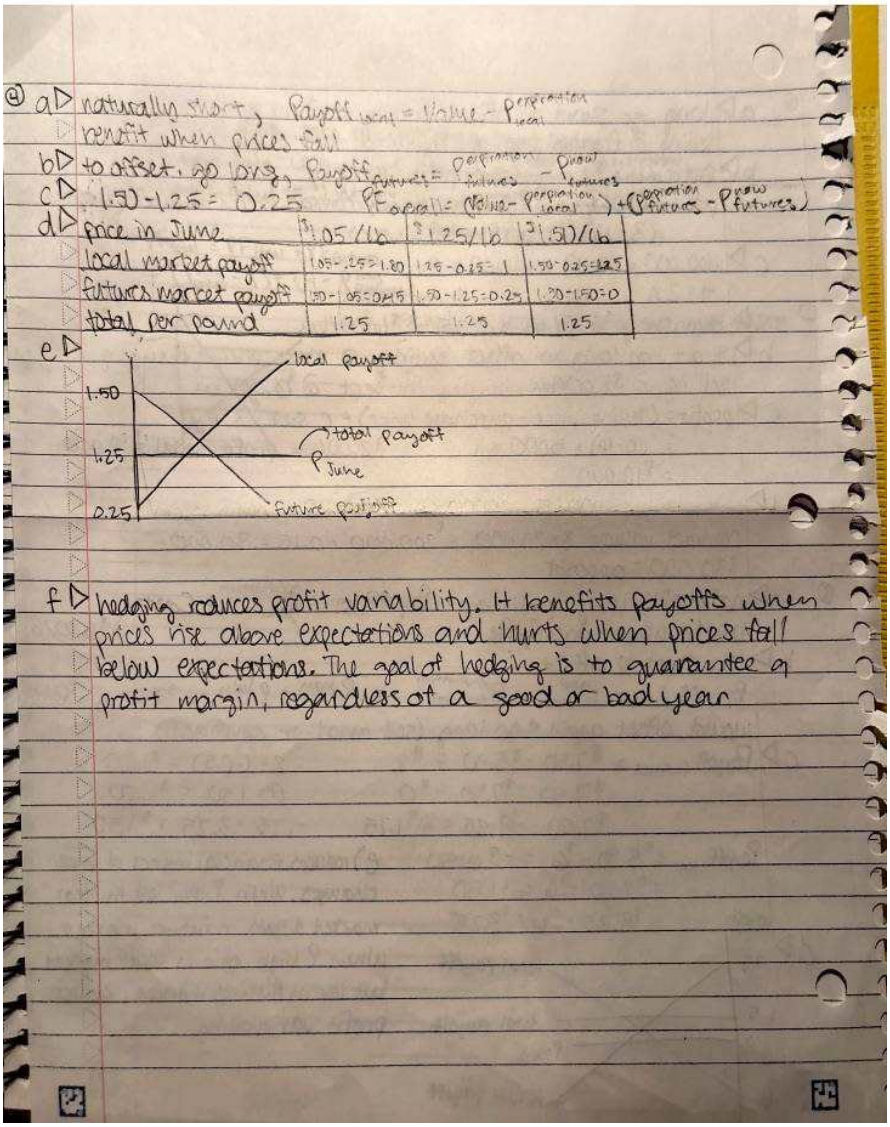
$= \$7.50 - \$6 = \$1.50$

$= \$9.25 - \$6 = \$3.25$

d)




e) reduces financial impact of price changes. When P low, lose in local market & gain in futures market. When P high, gain in local market but lose in futures market. Reduces profit variability.




**Student 321-32 (score 4)**

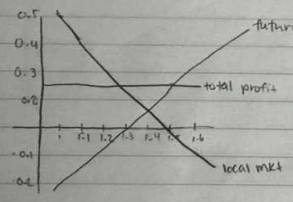
4a) You are in the short position because you need to buy cattle later.
Profit = 1.50 - P
You'll benefit if feeder cattle prices decrease.

4b) You should take the long position in the futures mkt.
Profit = $P_{June} - 1.25$

4c) Total Profit = (1.50 - P) + (P - 1.25)
= 1.50 - P + P - 1.25
= 1.50 - 1.25
= $0.25

| | local | futures | total |
|---|---|---|---|
| June 1.05 → | 1.50 - 1.05 = 0.45 | 1.05 - 1.25 = -0.20 | 0.45 + (-0.20) = 0.25 |
| 1.25 → | 1.50 - 1.25 = 0.25 | 1.25 - 1.25 = 0 | 0.25 + 0 = 0.25 |
| 1.50 → | 1.50 - 1.50 = 0 | 1.50 - 1.25 = 0.25 | 0 + 0.25 = 0.25 |

4e)




4f) The feedlot operator benefits from hedging when feeder cattle prices rise, but hedging negatively effects the operator when prices fall. The goal of hedging is to reduce profit variability.

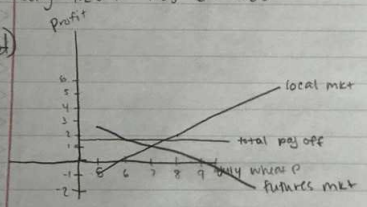
3a) You are in the long position in the local market.
profit = p - 6
You benefit when prices rise & lose when prices fall.

3b) You should take the short position in the futures market to offset local price variability risk.
$P = 7.50 - P_{July}$
In July right before the contract expires you would buy back the short position contracts

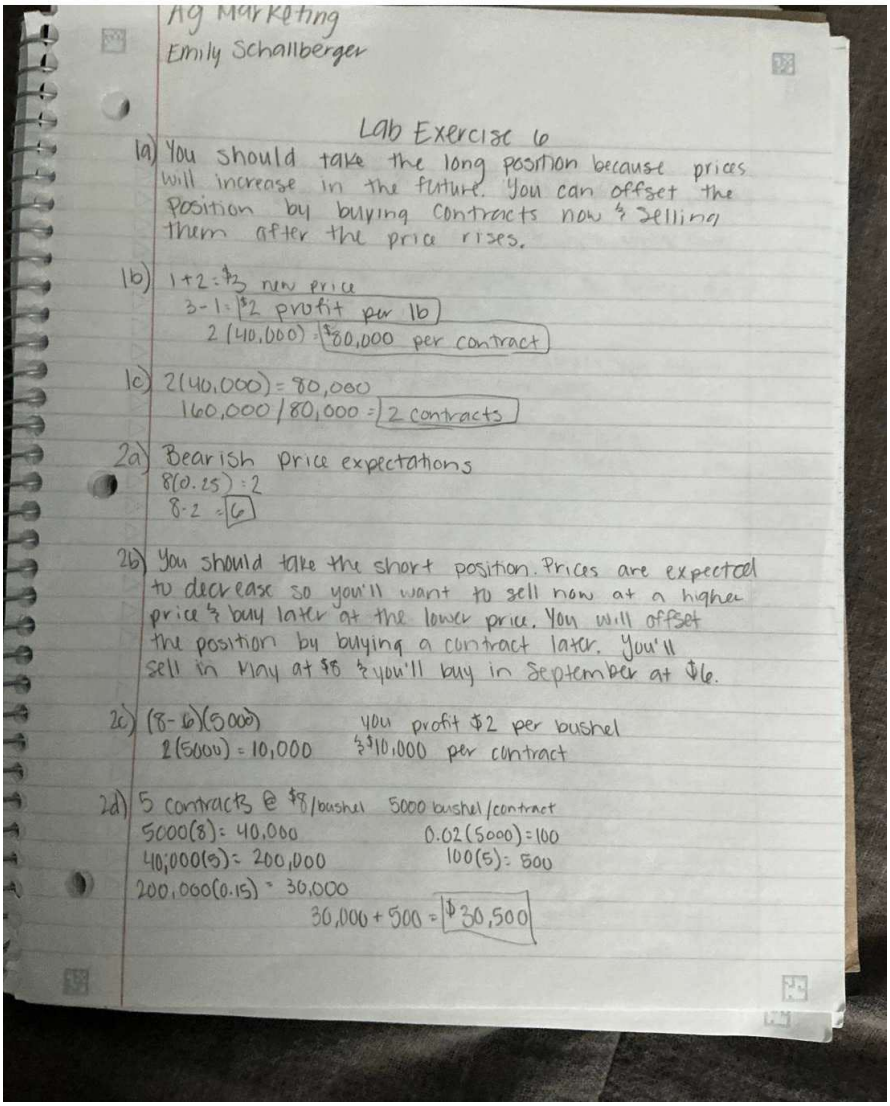
3c)

| | local | futures | total |
|---|---|---|---|
| July 5.50 → | 5.50 - 6 = -0.50 | 7.50 - 5.50 = 2 | -0.50 + 2 = 1.50 |
| July 7.50 → | 7.50 - 6 = 1.50 | 7.50 - 7.50 = 0 | 1.50 + 0 = 1.50 |
| July 9.25 → | 9.25 - 6 = 3.25 | 7.50 - 9.25 = -1.75 | 3.25 + (-1.75) = 1.50 |

3d)




3e) Farmers benefit from hedging because it helps protect them from risk. When prices are low, the farmer earns less in local mkts. but can buy back contracts for cheaper in futures mkts. which all together protects income. When prices are high, the farmer earns more in local mkts but has to buy contracts back at a higher price in futures mkts which leads to a hedging loss. Hedging does not maximize profits but it does reduce profit variability.



Ag Marketing
Emily Schallberger

Lab Exercise 6

1a) You should take the long position because prices will increase in the future. You can offset the position by buying contracts now & selling them after the price rises.

1b) 1+2=$3 new price
3-1=$2 profit per lb
2(40,000)=$80,000 per contract

1c) 2(40,000)=80,000
160,000/80,000=2 contracts

2a) Bearish price expectations
8(0.25)=2
8-2=6

2b) You should take the short position. Prices are expected to decrease so you'll want to sell now at a higher price & buy later at the lower price. You will offset the position by buying a contract later. You'll sell in May at $8 & you'll buy in September at $6.

2c) (8-6)(5000) You profit $2 per bushel
2(5000)=10,000 $10,000 per contract

2d) 5 contracts @ $8/bushel 5000 bushel/contract
5000(8)=40,000 0.02(5000)=100
40,000(5)=200,000 100(5)=500
200,000(0.15)=30,000
30,000+500=$30,500

**Student 321-33 (score 3)**

Lab 6

1) a) Long position and buy a contract. I would like to sell it later at a higher price. Bullish outlook.

b) profit = (SA − PH) × size × #

= (3 − 1) × 40,000 × 1 = $80,000

80,000 / 40,000 = ¢2/lb

c) 2 contracts

160,000 = (3 − 1) × 40,000 × c

160,000 = 80,000 c

80,000

2 = c

2) a) We are bearish, hoping to sell now & buy back at a lower price.

8 (0.25) = ¢6.00

b) Short, selling at ¢8.00, hoping to buy back at ¢6.00. We will buy a contract now.

c) profit = (8 − 6) × 5000 × 1 = ¢10,000

¢ 2 / bushel

d) Fee Commission → (0.02) × 5 (5000) = 500

| % | Contracts | bushels | Future price | |
|---|---|---|---|---|
| 15 | × 5 | × 5000 | × 8 | = ¢30,000 |

¢30,000 + 500 = ¢ 30,500 Deposit in May

3) a) seller has naturally long position, we benefit when the price rises in the local market

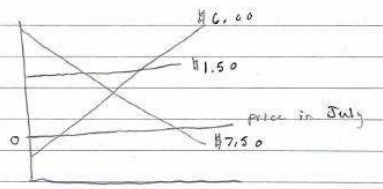
payoff of local = $P^{\text{expiration}}_{\text{local}}$ − ¢ 6.00

In July we want to buy to offset, this is because we sold in May. This is in hopes for a lower price, Long run.

c)

| Price in July | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| Local $= P^{July}_{Local} - 6$ | -0.50 | +1.50 | +3.25 |
| Future $= 7.50 - P^{July}_{Future}$ | 2 | 0 | -1.75 |
| Total | 1.50 | 1.50 | 1.50 |

d)




e) Farmers can overall benefit since you get money in tough times. However it costs you money when times are good. This allows them to benefit in the future market when the price decreases. This in turn reduces profit variability

4) a) Short in the local market because we are buyers.

$Payoff_{Local} = 1.50 - P^{expiration}_{Local}$

When price decreases, we benefit.

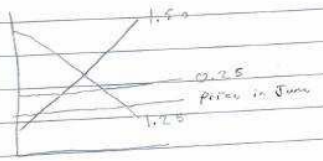
b) We will go long in future market.

$Payoff_{Futures} = P^{expiration}_{Future} - 1.25$

c) (1.50 - price) + (price - 1.25) = pp overall

| d) Future | 1.00 | 1.25 | 1.50 |
|---|---|---|---|
| 1.50 - price | 0.45 | 0.25 | 0 |
| price - 1.25 | -0.2 | 0 | .25 |
| Total | 0.25 | 0.25 | 0.25 |

e)




f) In the future market, a buyer gains when they're able to sell at a higher price later on. However, this can be risky because it locks in an assumed future price. The main objective is to balance current purchases and profit from rising prices in the futures market.

**Student 321-34 (score 3)**

# LAb 6:

1)

a) LONG position and buy a CONTRACT. I Hope to SELL it LATER at a HIGHER PRICE. BULLISH OUTLOOK.

b) PROFIT = (S$ - P$) x SIZE x #

(3 - 1) x 40,000 x 1 = 80,000

80,000 / 40,000 = 2/lb

c) 2 CONTRACTS

160000 = (3 - 1) x 40000 x C

$\frac{160000}{80000} = 80000$

2 = C

2)

a) We are BEARISH Hoping to SELL NOW & buy back at a lower price.

8 (0.25) = $6.00

b) SHORT, selling at $8.00 Hoping to buy back at $6.00. We will buy a contract NOW.

c) profit = $(8-6) \times 5000 \times 1 = 10000$

$2 per bushel

d) Fee Commission

$0.02 \times 5(5000) = 500$

% contracts bushels Futures price

15 x 5 x 5000 x 8 = 30000

30000 + 500 = 30500 Deposit price

3)

a) Seller has naturally long position, we benefit when price rises in the local market.

$payoffoflocal = P^{expiration}_{local} - 6.00$

b) Take short to offset.

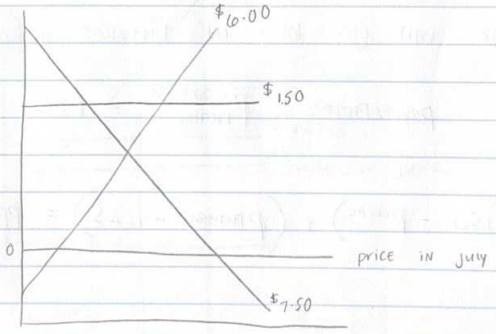
$payoff\ futures = 7.50 - P^{July\ Futures}$

In July we want to buy to offset, since we sold in May. In hopes for a lower price long-run.

c)

| PRICE IN JULY | 5.50 | 7.50 | 9.25 |
|---|---|---|---|
| LOCAL | | | |
| $= P^{July}_{Local} - 6$ | -0.50 | 1.50 | 3.25 |
| FUTURE | | | |
| $= 7.50 - P^{July}_{Future}$ | 2 | 0 | -1.75 |
| TOTAL: | 1.50 | 1.50 | 1.50 |

d)



e) FARMERS CAN BENEFIT BECAUSE IT GIVES YOU $ AT BAD TIMES, BUT COSTS YOU $ AT GOOD TIMES. THIS ALLOWS THEM TO BENEFIT IN THE FUTURES MARKET WHEN PRICE FALLS. THIS REDUCES PROFIT VARIABILITY.

4)

a) WE ARE SHORT IN LOCAL MARKET BECAUSE WE ARE BUYING.

$$payoff_{LOCAL} = 1.50 - P^{expiration}_{LOCAL}$$

WHEN PRICE DECREASES, WE BENEFIT.

b) WE WILL GO LONG IN FUTURES MARKET

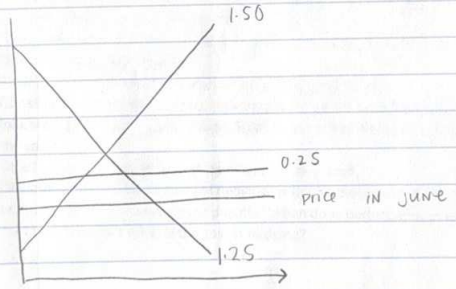
$$payoff_{FUTURES} = P^{expiration}_{FUTURE} - 1.25$$

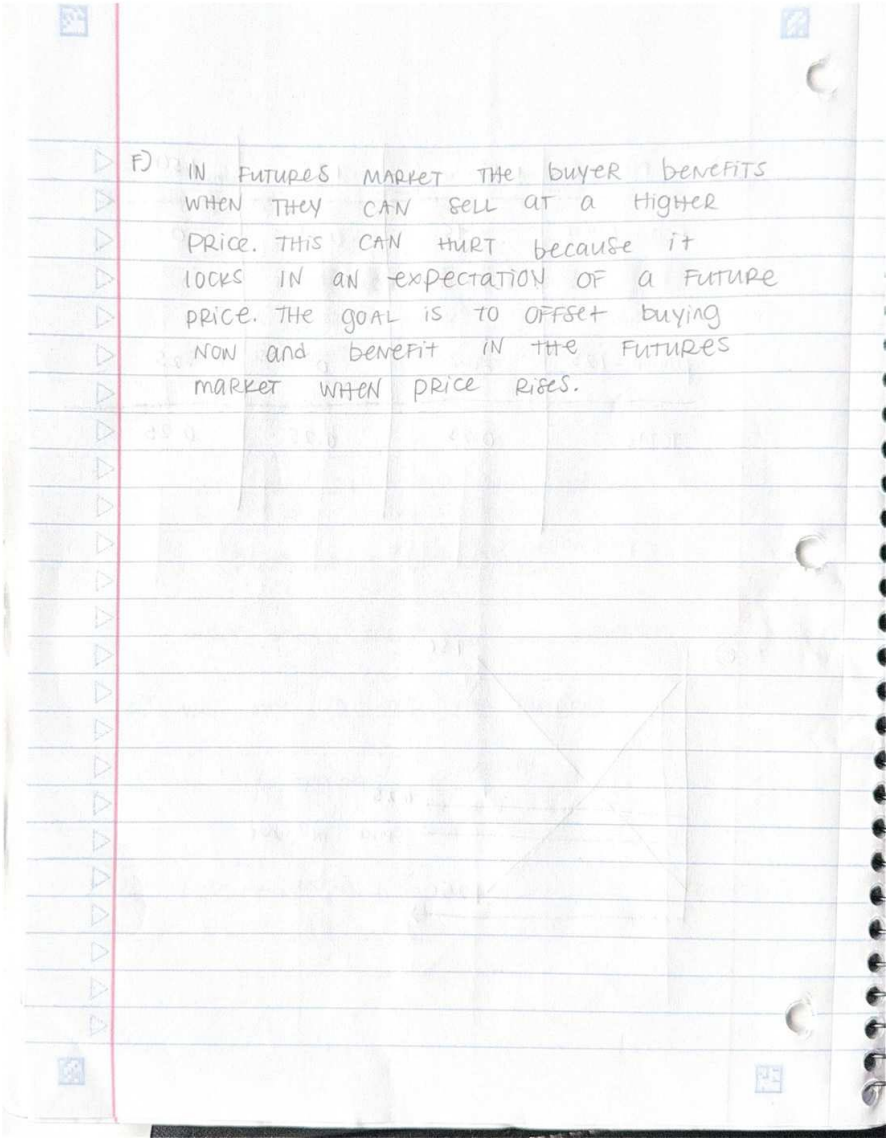
c) $(1.50 - P_{LOCAL}) + (P_{FUTURE} - 1.25) = P_{FOVERALL}$

d)

| FUTURE | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| 1.50 - p LOCAL | 0.45 | 0.25 | 0 |
| p FUTUR - 1.25 | -0.2 | 0 | .25 |
| TOTAL: | 0.25 | 0.25 | 0.25 |

e)






**Student 321-35 (score 3)**

4.) Feedlot

a- Long position

Local Profit = $P_{local} - 1.50$

You benefit when the price rises because you earn more.

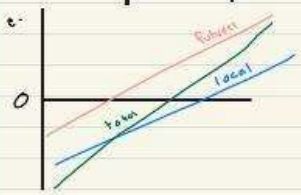
b- Long position. because if prices rise later you gain in the futures market

Futures Profit = $P_{futures} - 1.25$

c- Total Payoff = $(P_{local} - 1.50) + (P_{future} - 1.25)$

| d- Prices in June | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| local market | 1.05 - 1.50 | 1.25 - 1.50 | 1.50 - 1.50 |
| $P_L - 1.50$ | - 0.45 | - 0.25 | 0 |
| futures market | 1.05 - 1.25 | 1.25 - 1.25 | 1.50 - 1.25 |
| $P_0 - 1.25$ | -0.25 | 0 | 0.25 |
| Total | -0.65 | - 0.25 | 0.25 |

e-




f- Hedging is beneficial because it reduces price changes & gives you more predictable profits. It can cost you money if the prices move in your favor. futures market benefits when the price is moving against you. It hurts when the price is moving in your favor. The goal is to reduce risk in the markets

Assignment # 6

1.) Feed Tax

a- Take a long position since the price is increasing & you'll offset

Buy at $1 Sell at $3

b- $\text{Price}^{\text{future}} - \text{Price}^{\text{now}} = 3 - 1 = \$2$ profit/lb

$\$2 \times 40000 = \$80000$/contract

c- You should buy 2 contracts in June & sell in December to profit $160000

2.) Soybean Prices

a- You have a bearish price expectation because prices fall. Soybean prices will be $6/bu

b- Take a short position since the price is decreasing.

Sell at $8, hope to buy back later at $6

c- selling - purchasing = $(8-6) \times 5000 \times 1 = 10000$

d- commisson fee = $0.02\ (5 \times 5000) = \$500$

Margin Account = $0.15 \times 5000 \times \$8 = \$30000$ to deposit in May

3) Wheat

a- farmers are naturally long, our profit equation is $\text{Payout}_{\text{local}} = P^{\text{expected}}_{\text{local}} - \text{cost}$, you benefit when the cost rises

b- You would take a short position

$\text{Payout}_{\text{future}} = P^{\text{May}} - P^{\text{July}} = 7.50 - P^{\text{July}}$

| c- Prices on July | 6.50 | 7.50 | 9.25 |
|---|---|---|---|
| local market | 6.50 - 6 | 7.50 - 6 | 9.25 - 6 |
| $P^{\text{July}} - 6$ | -0.50 | 1.50 | 3.25 |
| futures market | 7.50 - 5.50 | 7.50 - 7.50 | 7.50 - 9.25 |
| $7.50 - P^{\text{July}}$ | 2.00 | 0 | -1.75 |
| Total | $1.50 | $1.50 | $1.5 |




e- Farmers benefit from hedging because it protects themselves from price fluctuations. When local price is low they get less money. The farmer buys futures at a low price so he can sell it for more later. The gain from futures offsets the loss from local markets. When prices are high hedging costs you money. It reduces variability because you are locked in on a price

**Student 321-36 (score 4)**

b) buy 40,000 lbs for $1 sell 40000 lbs for $3

3 - 1 = 2 × 40000 = $ 80,000

$ per barrel  $ total

$ per barrel = $2

$ total = $80000

c) 160000 = (3 - 1) × 40,000 × (n)

160000 ÷ 80000 × (n)

2 = n

you should buy 2 contracts

## 2

a) bearish price expectation

8 × .75 = $6 September prices will be at $6

b) take a short position, offset with a long position, Sell in May at $8, buy in September at $6

c) (8 - 6) 5000 × 1 =

(2) 5000 × 1 = 10000

$ 2 per barrel

$10000 total profit for 1 contract

d) 5000 × 5 = 25000 × .02 = 500

$500 commission fee

Contract Q = 25000

25000 × 8 + 25000 × .15 = 30000

Margin of 30000

deposit of $30,000 needed for May

$P_{payoff\ local} = P^{expectation}_{local} - Cost$ $P_{payoff\ local} = P^{expectation}_{local} = 6.00$

you will benefit when prices rise

b) take short position to offset

$P_{payoff\ future} = P^{agent}_{futures} - P^{expectation}_{futures}$ $P_{payoff\ futures} = P_{may} - P_{july} = 7.50 - P_{july}$

in July you would offset your future short position by taking a future long position

c)

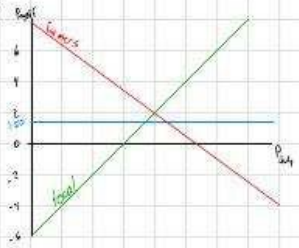
| Payoff futures | Payoff local |
|---|---|
| 7.50 - 5.50 = $2 | 5.50 - 6 = $-.50 |
| 7.50 - 7.50 = $0 | 7.50 - 6 = $1.50 |
| 7.50 - 9.25 = $-1.75 | 9.25 - 6 = $3.25 |

2 - .50 = $1.50 $\pi$ 5.50 = $1.50

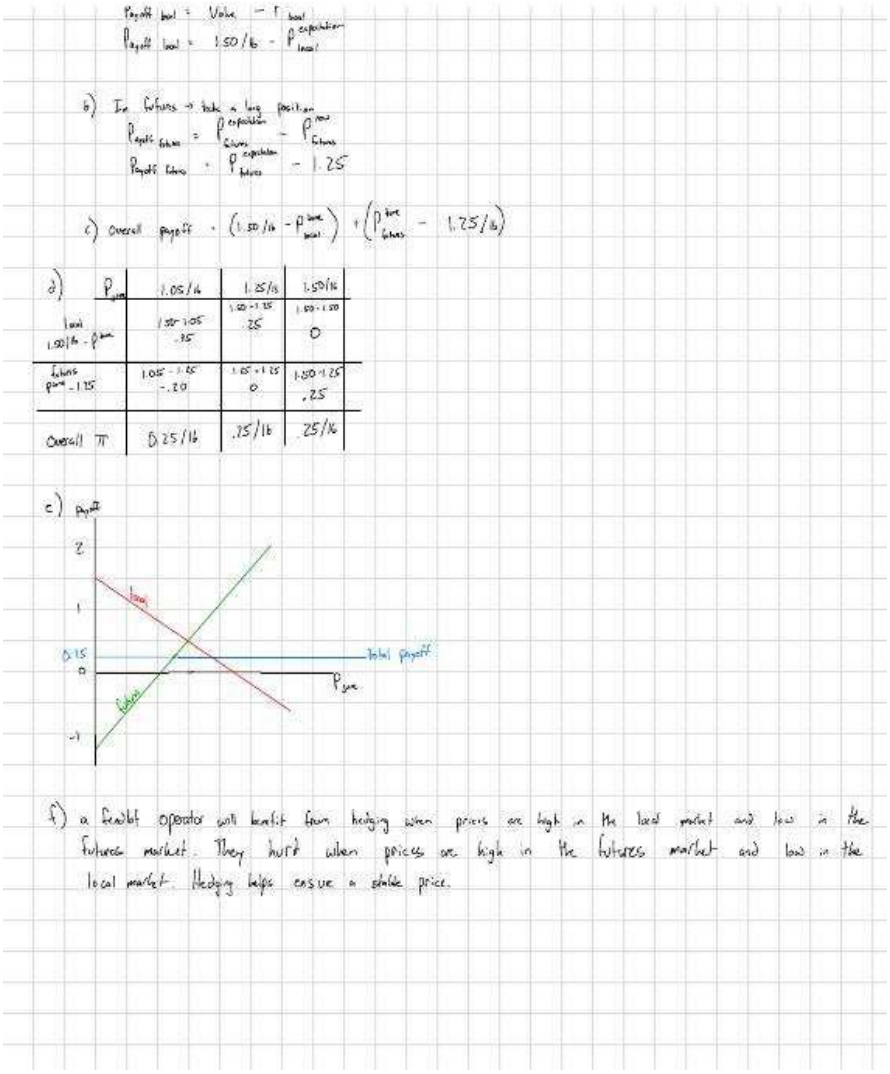
0 + 1.50 = $1.50 $\pi$ 7.50 = $1.50

-1.75 + 3.25 = $1.50 $\pi$ 9.25 = $1.50

d)




e) Farmers benefit from hedging because it ensures a stable price and protects their profits. When prices are low they will loose money in local markets but will gain in future markets. When prices are high you gain in local markets and lose in future markets. The goal isn't to maximize profits but rather keep producers from loosing money. This reduces profit variability.




**Student 321-37 (score 4)**

Economics of Ag Marketing: Lab Exersize #10

① a. Long position. you will buy now and sell later in hopes of making a profit, you have a bullish price expectation. buy at $1, sell at $3.

b. $2 profit per lbs  Profit = (3 − 1) × 40,000 × 1 = $80,000
$2 = ÷40,000

c. 2 contracts  160,000 = (3 − 1) · 40,000 · X
160,000 = 80,000 · x → x = 2

② a. bearish price expectations, because you expect it to decrease. the futures price would be $6.

b. short position. you will sell now at $8 and hope to buy later at the lower price of $6.

c. You will profit $2 per bushel if your price expectations are correct. If you trade 1 contract you will profit $10,000.
Profit = (8 − 6) · 5,000 × 1 = 10,000

d. you need to deposit $30,500 in May.  5 × 5,000 = 25,000
commission = 0.02 × 25,000 = $500
30,000 + 500 = 30,500  margin = 0.15 × 5 × 5,000 × $8 = 30,000

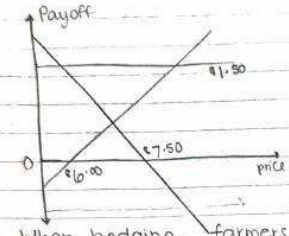
③ a. you take the long position in the local market as producers are naturally long. You will benefit if prices rise.
Payoff local = $P_{local}^{expiration}$ − Cost  cost = $6

b. To offset this you would take a short position in the futures market. Payoff futures = $7.50 − P^{exp.}$ → $Payoff_{futures} = P_{futures}^{now} - P_{futures}^{expiration}$
In July, you want to buy contract in hopes of a lower price.

c.

| price in July | $5.50/bu | $7.50/bu | $9.25/bu |
|---|---|---|---|
| Local Market Payoff: p − $6 | $ − 0.50 | $1.50 | $3.25 |
| Futures Market Payoff: $7.50 − p | $2 | $0 | $ − 1.75 |
| Total per Bushel | $1.50 | $1.50 | $1.50 |

d.




e. When hedging, farmers benefit in the futures market when prices are low and lose out in the local market. It is vice versa when prices are high (hedging losses). In actuality, hedging doesn't really maximize profits it just reduces profit variability.

④ a. Short position. You benefit when the prices fall.

Payoff local = Value - $P_{expiration}^{local}$

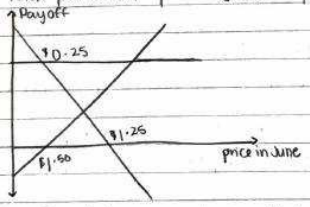
b. You would take the long position in the futures market to offset this. Payoff futures = $P_{futures}^{expiration} - P_{futures}^{now}$

c. PF overall = $(1.50 - P_{local}^{expiration}) + (P_{futures}^{expiration} - 1.25)$

d.

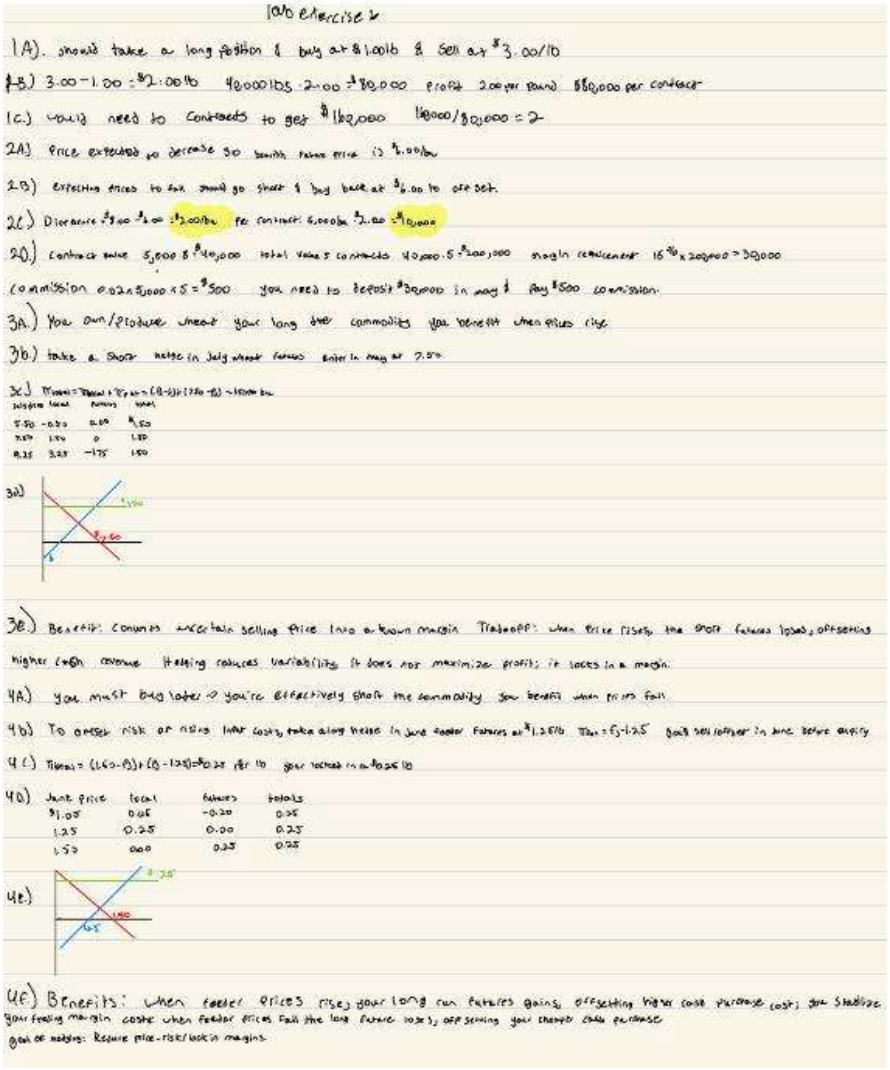
| price in June | $1.05/lb | $1.25/lb | $1.50/lb |
|---|---|---|---|
| Local Market Payoff (1.50 - P) | $0.45 | $0.25 | $0 |
| Futures Market payoff (P - 1.25) | -$0.20 | $0 | $0.25 |
| total per bushel | $0.25 | $0.25 | $0.25 |

e.




f. The feedlot operator will benefit from hedging in the local market. However, the futures market will hurt their benefits when price is $1.05. The goal of hedging is to offset price position and reduce profit variability.

**Student 321-38 (score 4)**




**Student 321-39 (score 3)**

or taking a short position in June. I would buy the contracts at $1 but sell them for $3.

b. (40,000 x 3) - (40,000 x 1)
120,000 - 40,000 = $80,000 per contract
3 - 1 = $2 per lbs

C. If each contract receives a profit of $80,000, you will need at least 2 contracts to make a profit of $160,000.

2)

a. I have bearish price expectations. I would except price to be $6 in September

b. I would take a short position. I would sell soybeans now and buy them later. I would sell the contracts for $8 and buy them for $6.

C. 8 - 6 = $2 per bushel
(5,000 x 8) - (5,000 x 6) = 40,000 - 30,000 = $10,000 per contract.

d. 5,000 x 8 x 5 = $200,000
200,000 x .15 = $30,000
5 x 5,000 x .02 = 500
You would need $30,000 in the margin account and $500 for commission.

3)

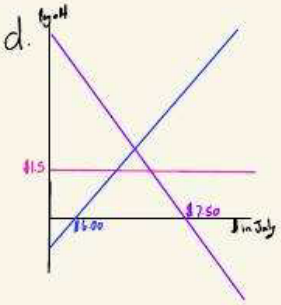
a. I would take a long position in the local market.
$Pf_{local} = P^{July}_{local} - \$6.00$
I would benefit if prices rise.

b. I would take a short position in the futures market.
$Pf_{futures} = \$7.50 - P^{July}_{futures}$
You buy wheat at the going price then deliver on your futures contracts

C.

| | $5.50 | $7.50 | $9.25 |
|---|---|---|---|
| Local | 5.50 - 6<br>$ - 0.5 | 7.50 - 6<br>$1.5 | 9.25 - 6<br>$3.25 |
| futures | 7.50 - 5.50<br>$2 | 7.50 - 7.50<br>$0 | 7.50 - 9.25<br>$ - 1.75 |
| Total per bushel | $1.5 | $1.5 | $1.5 |

d.



4)

a. I would take a short position in the local market
$P_{l,now} = 1.50 - P^{future}_{now}$
You will benefit if prices decrease.

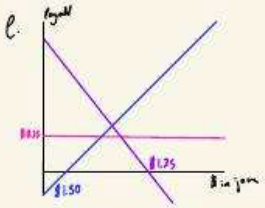
b. You would take a long position.
$P_{future} = P^{now}_{future} - 1.25$

C. = TPP = $P_{l,now} + P_{future}$
$(1.50 - P_{now}) + (P_{now} - 1.25)$
$1.50 - 1.25 = \$0.25/lbs$

D.

| | $1.05 | $1.25 | $1.50 |
|---|---|---|---|
| local | 1.50 - 1.05 $0.45 | 1.50 - 1.25 $0.25 | 1.50 - 1.50 $0 |
| Futures | 1.05 - 1.25 $-0.20 | 1.25 - 1.25 $0 | 1.50 - 1.25 $0.25 |
| total | $0.25 | $0.25 | $0.25 |

e.




f. A benefit is that the feedlot operator can still gain in the futures market if they experience a loss in the local market
A cost is that if prices fall they can experience loss on futures contract which can offset gains in the local market
The goal of hedging is to reduce profit risk and stabilise margins.

**Student 321-40 (score 3)**

Lab #6

1.) Long run; Buy (June) at $1/lb and sell (December) at $3/lb.

B.) 40,000 · 1 = 40,000 120,000 − 40,000 = $80,000
40,000 · 3 = 120,000 $2/lb profit

c.) 160,000/40,000 = 4 contracts

2.) Bearish; $6 ~~cents~~/bu

b.) Short run; Sell at (May) $8/bu and buy at (September) $6/bu

c.) 5,000 · 2 = $10,000 8 − 6 = $2

d.) 8 · 5000 = 40,000 · .15 = 6,000 · 5 = 30,000 · 0.02 = $500
∴ $30,000 .

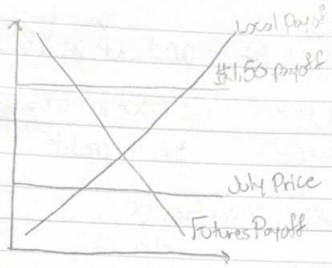
3.) Short run; $PF_{local} = P^{July}_{local} - 6$

b.) If you are selling, you benefit from higher costs & if you're buying you will benefit from lower prices $PF_{futures} = 7.50 - P^{July}_{futures}$

c.)

| Price in July | $5.50 | $7.50 | $9.25 |
|---|---|---|---|
| Local Payoff | 5.5−6 = −0.50 | 7.50−6 = 1.5 | 9.25−6 = 3.25 |
| Future Payoffs | 7.50−5.50 = 2.00 | 7.50−7.50 = 0.00 | 7.50−9.25 = −1.75 |
| Total/bu | 1.50 | 1.50 | 1.50 |

d.)




e.) Low prices = protection benefit
High prices = hedging cost
Hedging doesn't maximize profit because it reduces variability and locks in a more fixed price

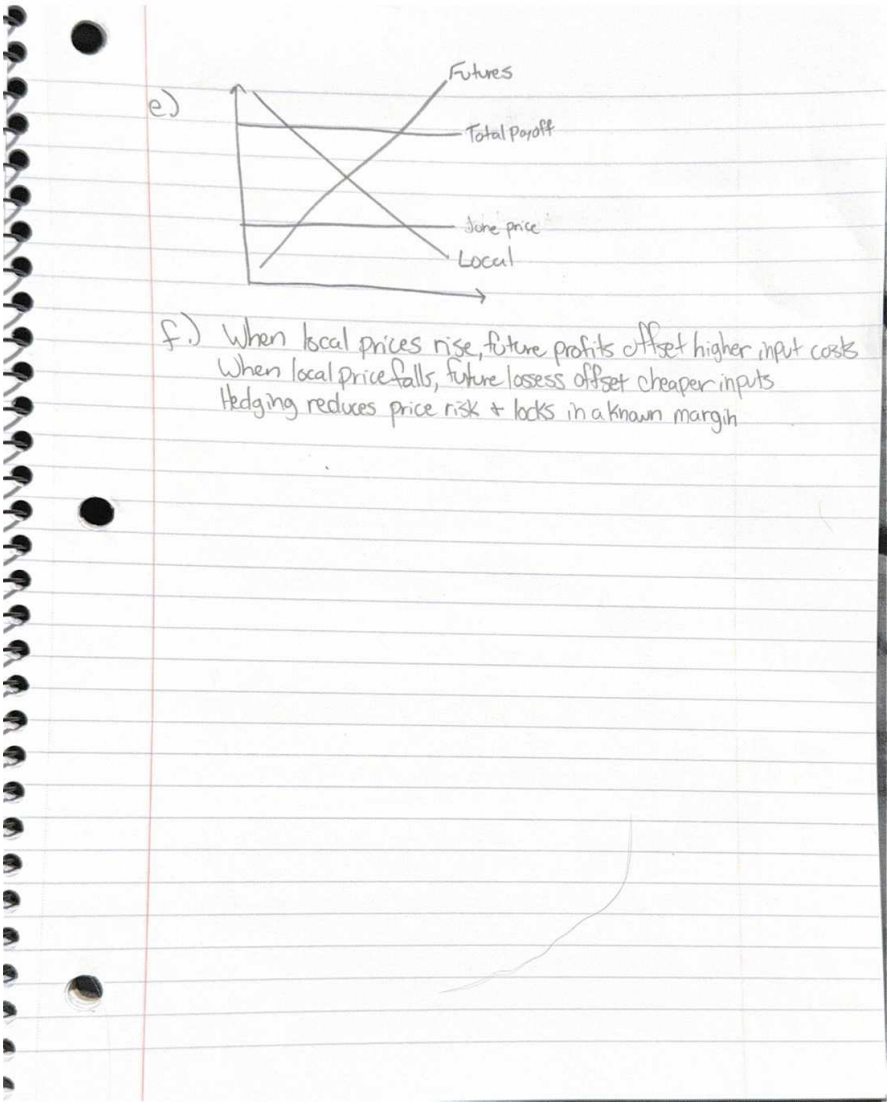
4.) short run; $PF_{Local} = P^{June}_{local} - 1.50_{Local}$ ; Low price = benefit

b.) $PF_{futures} = 1.25 - P^{June}_{future}$
Buy at 1.25 and sell at 1.50

c.) Overall Payoff = $(P^{June}_{Local} - 1.50) + (1.25 - P^{June}_{future})\$0.25/lb$

d.)

| June $ | $1.05 | $1.25 | $1.50 |
|---|---|---|---|
| Local | 1.05-1.50= -0.45 | 1.25-1.50= -0.25 | 1.50-1.50= 0 |
| futures | 1.25-1.05= 0.20 | 1.25-1.25= 0 | 1.25-1.50= -0.25 |
| Total | +0.25 | -0.25 | -0.25 |

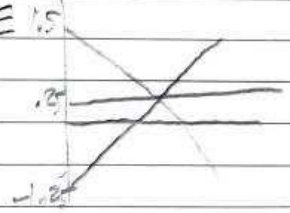



**Student 321-41 (score 3)**

D

| $P_{Wheat}$ | 1.05 | 1.25 | 1.5 |
|---|---|---|---|
| 1.5 | .25 | .25 | 0 |
| -1.25 | -.20 | 0 | .25 |
| Overall | .25 | .25 | .25 |

E




F.

When prices are high in the markets and low in farming operation benefits from hedging they hurt when the situation is opposite. hedging ensures prices.

C.

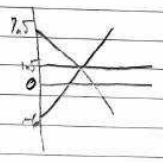
| Futures | Local |
|---|---|
| 7.5 - 5.5 = $2 | 5.5 - 6 = -.5 |
| 7.5 - 9.25 = -1.75 | 7.5 - 6 = 1.5 |
| | 9.25 - 6 = 3.25 |

2 + -.50 = 1.5

2 + 1.5 = 1.5

-1.75 + 3.25 = 1.5

D.




E

For the feed lot operator hedging is beneficial because it protects profits, high futures market prices means you gain, low prices means you lose in local markets hedging helps you from losing money,

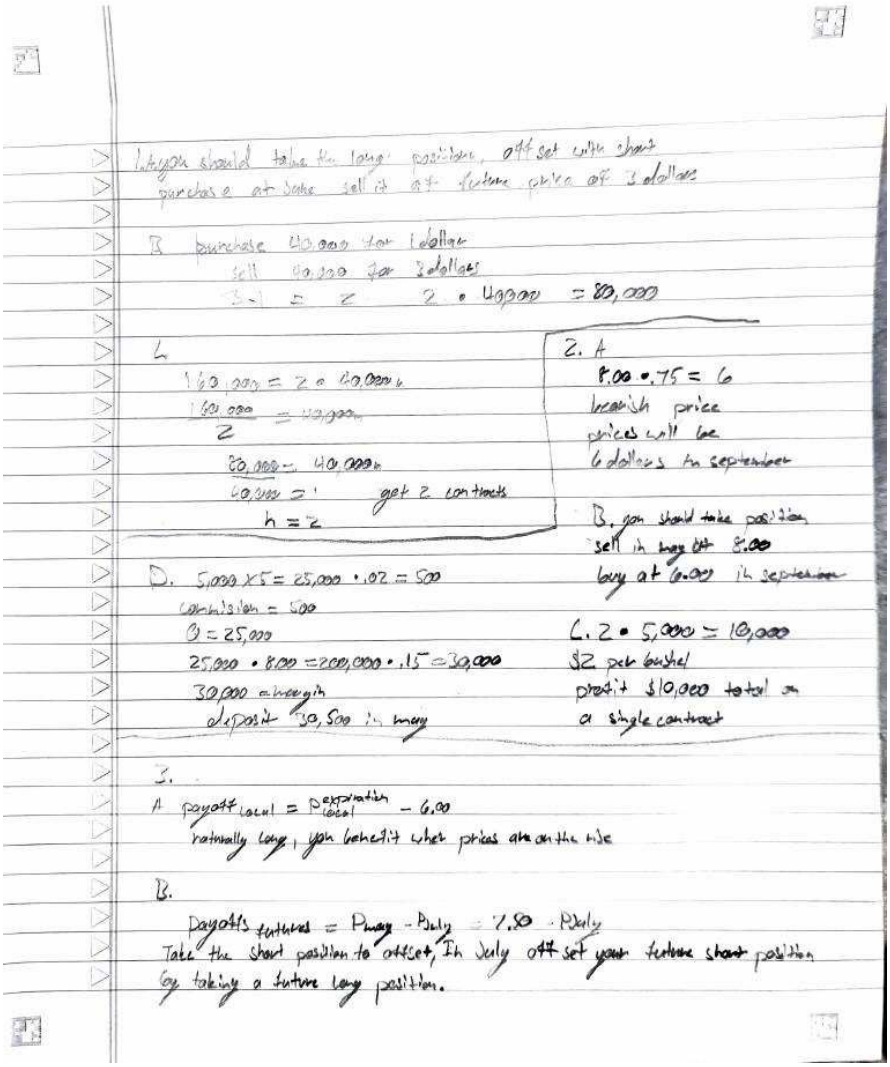
4. If you are naturally short in the local market you benefit when prices fall

$$\text{payoff}_{\text{local}} = 1.5(16 - P_{\text{expiration local}})$$

B. take long position in futures

$$\text{payoff futures} = P_{\text{expiration futures}} - P_{\text{new futures}}$$

C. overall payoff $= (1.5(16 - P_{\text{future local}}) + (P_{\text{future futures}} - 1.25 \cdot 2)$




**Student 321-42 (score 2)**

# Lab Exercise 6

1. a. You should take long. You will buy at $1 now and sell at $2 later.

b. You will profit $2 per pound since you buy at $1 and sell at $3.
40,000 · 2 = $80,000 per contract

c. 2 contracts

2.
a. Bearish price expectations. If we are correct the price in September will be $6.

b. Short because you will sell at $8 and buy later at $6.

c. Profit $2 per bushel if our price expectations are correct.

5,000 x 2 = $10,000 per contract

d. 5 x 5,000 = 25,000 bushels

.02 x 25,000 = $500 commission fee

5 x 5,000 x 8 = 200,000 x .15 = 30,000

Total deposit = 30,500

3.

a. you are in long position. You benefit when prices rise

$Payoff_{local} = P_{wheat} - 6 \times Q_{bushel}$

b. you would take short in July

$Payoff_{future} = P_{futures}^{now} - P_{futures}^{expiration} = 7.50 - 6 = \$1.50$

c. $Payoff_{local} = 7.50 - 6 = 1.50$ bushel $> 1.50$

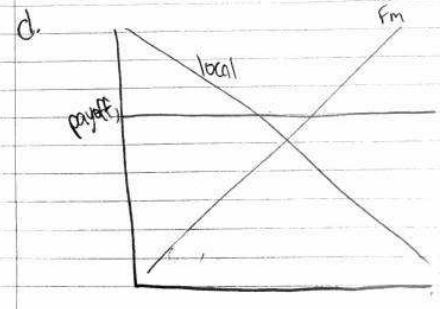
$Payoff_{future} = 7.50 - 7.50 = 0$

$5.50 - 6 = -.50$
$7.50 - 5.50 = 2 > 1.50$

$9.25 - 6 = 3.25$
$7.50 - 9.25 = -1.75 > 1.50$

e. He benefits because he always runs a slight profit because of hedging even when prices rise. Hedging can do both.

d.



4.

a. short position; Benefit when prices fall

$Payoff_{local} = 1.50/lb - Cost$

b. long position

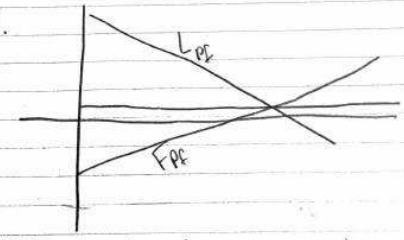
$Payoff_{future} = P^{expiration} - 1.25$

c. $Payoff_{overall} = (1.50 - (cost) + (P^{expiration} - 1.25)$

d.

| price | 1.05 | 1.25 | 1.50 |
|---|---|---|---|
| local | 1.50-1.05 = .45 | 1.50-1.25 = .25 | 1.50-1.50 = 0 |
| future | 1.05-1.25 = -.20 | 1.25-1.25 = 0 | 1.50-1.25 = .25 |
| total | .25 | .25 | .25 |

e.

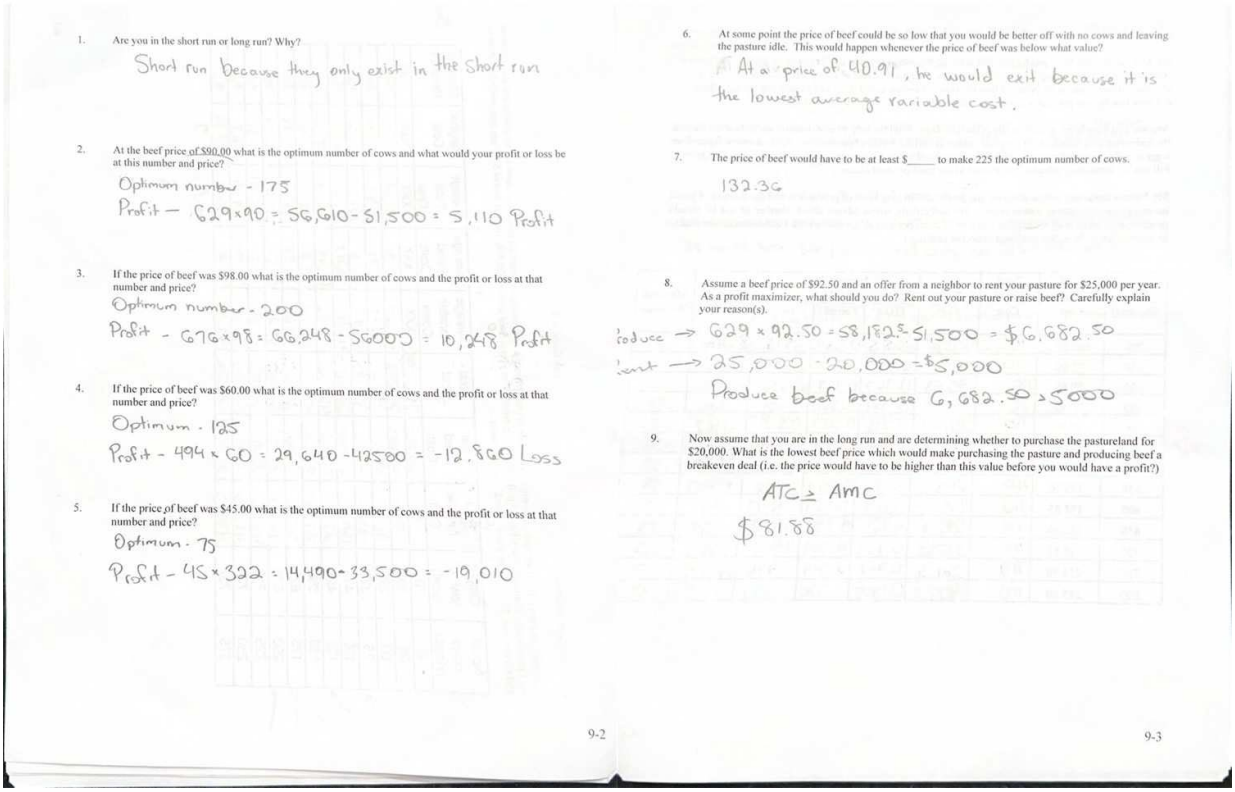



f. Hedging makes it to wear they always see the same payoff and hold it consistent. Participating hurts when prices rise. The goal is to have a more consistent profit.

# Appendix C. AGBE 341 student submissions (Lab Exercise 6, Part I)

Part I, questions 1-9 (pasture cost analysis). Pages are as submitted, anonymized; the top margin has been blanked to remove any name. Two-page spreads show pages 9-2 and 9-3 of the lab.

## Student 341-01 (score 3)



1. Are you in the short run or long run? Why?

Short run because they only exist in the short run

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

Optimum number - 175

Profit – 629×90 = 56,610 - 51,500 = 5,110 Profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum number - 200

Profit - 676×98 = 66,248 - 56000 = 10,248 Profit

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum - 125

Profit - 494 × 60 = 29,640 - 42500 = -12,860 Loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum - 75

Profit – 45 × 322 = 14,490 - 33,500 = -19,010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

At a price of 40.91, he would exit because it is the lowest average variable cost.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

132.36

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Produce → 629 × 92.50 = 58,182.5 - 51,500 = $6,682.50

Rent → 25,000 - 20,000 = $5,000

Produce beef because 6,682.50 > 5000

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

ATC ≥ AMC

$81.88

9-3

## Student 341-02 (score 3)

1. Are you in the short run or long run? Why?

Short run because we have fixed costs.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 cows 90x629 56610 - 51500 = 5110$

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

676 x 98

200 66248 - 56000 = 10,248$

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

499 x 60

125 29,940 - 42,500 = -12560$

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75

-14,010$

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

40.00$ You would stop producing and save 20,000 Cost

7. The price of beef would have to be at least $ 132.5 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

175 66,825$ profit raise beef because even w/out cows you make 20,000 fixed cost so 25,000 - 20,000 = 5000$ cattle have higher profit

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

175 cows 81.9$

9-3

## Student 341-03 (score 4)

1. Are you in the short run or long run? Why?

Short run because you have 20,000 in Fixed costs and there are no Fixed costs in the long run.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

At a price of $90/cwt the optimal number of cows is 175. This will result in a profit of $5,110. 629.90 = 56610 56610-51,500=5110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

at a price of $98/cwt the optimum number of cows is 200. This will result in a profit of $10,248. 676.98=66,248 -56000 = 10248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

At a price of $60/cwt the optimum number of cows is 125. Loss at this level will be -$2,560. 499.60 = 35640 - 42500 = -6,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

At a price of $45/cwt the optimum # of cattle is 75. The loss for this production level is -$19,010

322.45 = 14490 14,490 - 33,500 = -19,010

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

At any price below $40.8$/cwt this operation would be better off not producing at all.

7. The price of beef would have to be at least $132.75 to make 225 the optimum number of cows.

132.75

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

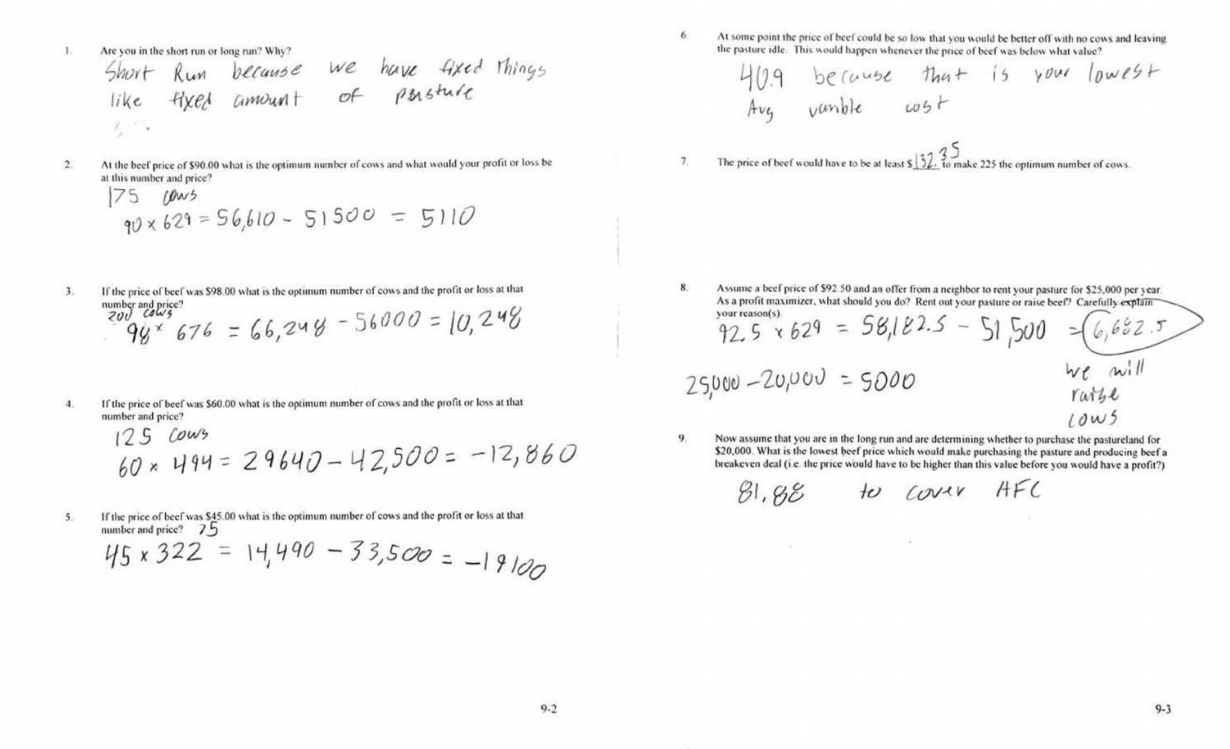
At a price of $92.50 the profit is 6,682.5 so he would be better off producing and making $1682.5 more than if we rented the land 629.92.50 = 58,182.5 58,182.5-51,500 = 6,682.5 25,000-20,000 = 5,000

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

The lowest beef price he would have to break even is about $81.68/cwt.

9-3

## Student 341-04 (score 3)



1. Are you in the short run or long run? Why?
Short Run because we have fixed things like fixed amount of pasture

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
175 cows
90 x 629 = 56,610 - 51500 = 5110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
200 cows
98 x 676 = 66,248 - 56000 = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
125 cows
60 x 494 = 29640 - 42,500 = -12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price? 75
45 x 322 = 14,490 - 33,500 = -19100

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
40.9 because that is your lowest Avg variable cost

7. The price of beef would have to be at least $ 32.75 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
92.5 x 629 = 58,182.5 - 51,500 = 6,682.5
25,000 - 20,000 = 5000
we will raise cows

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
81.88 to cover AFC

9-3

## Student 341-05 (score 4)

1. Are you in the short run or long run? Why?

We have a fixed cost, so we are in the Short-Run.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 Heads b/c that's right before our MC is higher than 90. We would make $5,110.

(90·629) - (51,500) = 5,110.

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 Heads b/c MC = 95.74.

Profit/Loss = (98·676) - (56,000) = $10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 Heads b/c MC = 55.5

Profit/Loss = (60·494) - (42,500) = $-12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 Heads b/c MC = 44.12

Profit/Loss = (45·322) - (33,500) = $-19,010.

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

You would exit the market when you can no longer cover your AVC. The lowest AVC we have is 40.91, if the price of beef was ever below $40.91, you would exit.

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.

$ 132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Raised Beef Profit = (92.5·629) - (51,500) = $6,682.5

Rented Pasture = 25,000 - 20,000 = $5,000

You would want to raise cattle b/c $6,682.57 $5,000.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

$81.88 Because this is where your ATC covers your MC.

9-3

**Student 341-06 (score 4)**

1. Are you in the short run or long run? Why?

Short run because there are fixed costs being recorded.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

At a price of $90.00 the optimum numbers of cows is 175.

Profit = 56160 - 51500 = $5110.00

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

If the price was $98.00 the optimum number of cows would be 200. Profit = 66248 - 56000 = 10248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

If the price was $60.00 the optimum number of cows would be 125 LOSS = 29640 - 42500 = (12860)

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

If the price was $45.00 the optimum number of cows would be 75 LOSS = 14490 - 33500 = (19010)

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

leaving the pasture idle would happen when the price falls below $40.91

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.

To make 225 the optimum number of cows, the price of beef would have to be at least $132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

At a price of $92.50, profit would be 6,682.50 which is higher than the $5000 of profit you would get from renting out the pasture. Therefore, you should keep producing.

25000 - 20000 = 5000 < (92.5 - 62.9) - 51500 = 6,682.5

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

The lowest price of beef that would make purchasing the pasture & producing beef a breakeven deal is $81.88.

9-3

## Student 341-07 (score 3)

1. Are you in the short run or long run? Why?

Short run. You have fixed costs and you have a fixed amount of pasture.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 cows. 629 x 90 = 56610 - 51560 = 5110

$5110 profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows. 676 x 98 = 66248 - 56000 = 10248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows 494 x 60 = 29640 - 42500 = -12860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows 322 x 45 = 14490 - 33500 = -19010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

Below $40 as this wouldn't cover AVC at it's lowest.

7. The price of beef would have to be at least $ 133 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Raise beef. At $92.50 we would profit $6682.5 while if we rent out we will only make $5000

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

$ 81.88 to cover AFC

9-3

## Student 341-08 (score 4)

1. Are you in the short run or long run? Why?

Short run because of fixed costs

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 cows

629 x 90 = 56,610 - 51,500 = $5,110 profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows

98 x 676 = 66,248 - 56,000 = $10,248 profit

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows

60 x 494 = 29,640 - 42,500 = -$12,860 loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows

45 x 322 = 14,490 - 33,500 = -$19,010 loss

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

$40.91 /cwt because that is the lowest Avg. Variable cost

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

$132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

92.50 x 629 = 58182.5 - 51,500 = $6,682.50

25,000 - 20,000 = $5,000

You should raise beef because your profit is higher than if you rented out your pasture.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

$81.88 /cwt

9-3

## Student 341-09 (score 3)

1. Are you in the short run or long run? Why?

Short run, you own a fixed amount of pasture, the pasture can't be changed. The short run is the period of time during which the quantity of one or more production is fixed and cannot be changed, the pasture is the fixed input.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

TR = 90 · 629 = $56,610

TC: 51,500

Profit = 5,110

optimum number of cows: 175

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price? at $98 where MC ≥ $98 (output = 676 CWT, MC = 95.74)

TR = 98 · 676 = 66,248 TC = 56,000

profit = 10,248

optimum # of cows: 200

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price? at $60 where MC ≥ 360 (output = 494 CWT)

$60 vs AVC $45.56 P > AVC

TR = 29,640

TC = 42,500

loss = 12,860

optimum # of cows: 0

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price? 75 cows, profit/loss = -19,010

optimum # of cows: 0

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

you should idle the pasture when price falls below the minimum AVC, AVC = $40.41 /CWT (at 50 cows)

Stop producing if P < $40.91 CWT

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

MC at 225 cows → $132.35 /CWT

price must be at least $132.35/CWT

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Raising beef

at $92.50 → 175 cows output at 629 CWT

TR = $58,182.50 TC = $51,500

beef profit = $6,682.50

Renting

Revenue = $25,000

20,000 Still owed

= $5,000

[Decision: Raise Beef]

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

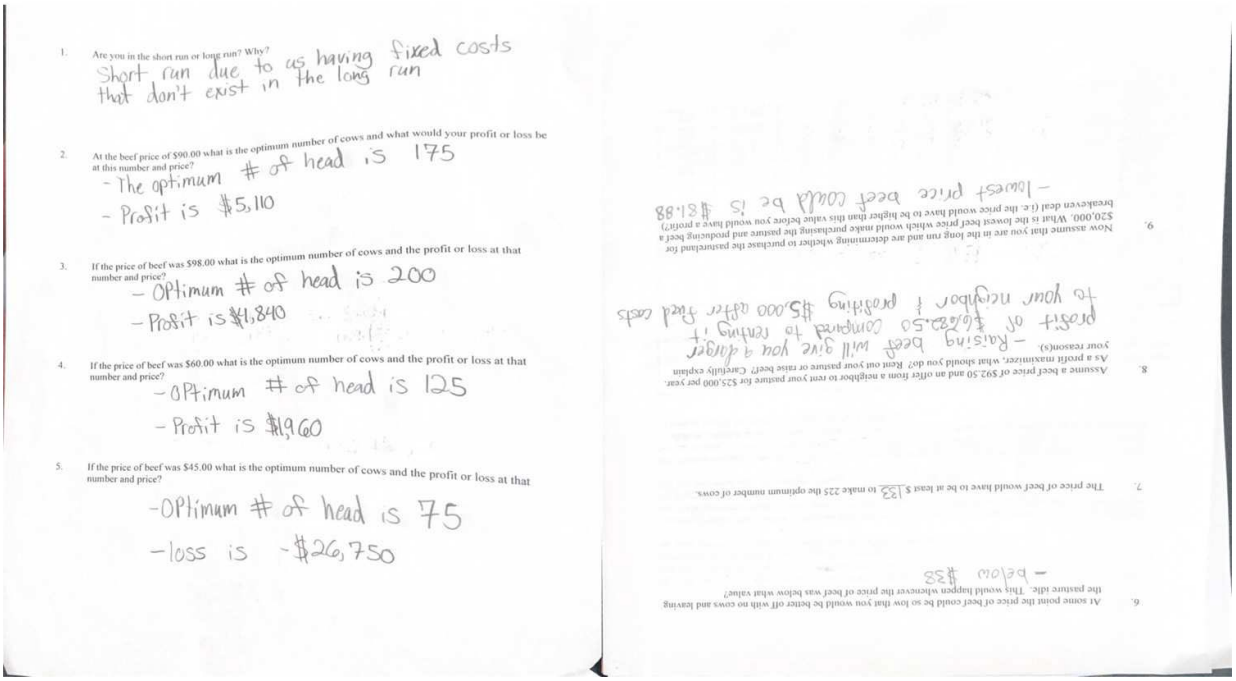
In the long run, all costs are variable

The minimum ATC in the table = $81.88/CWT (at 175 cows, output = 629 CWT)

The beef price must be at least $81.88/CWT to break even in the long run.

9-3

## Student 341-10 (score 2)



1. Are you in the short run or long run? Why?
Short run due to us having fixed costs that don't exist in the long run

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
- The optimum # of head is 175
- Profit is $5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
- Optimum # of head is 200
- Profit is $1,840

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
- Optimum # of head is 125
- Profit is $1960

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
-Optimum # of head is 75
-loss is -$26,750

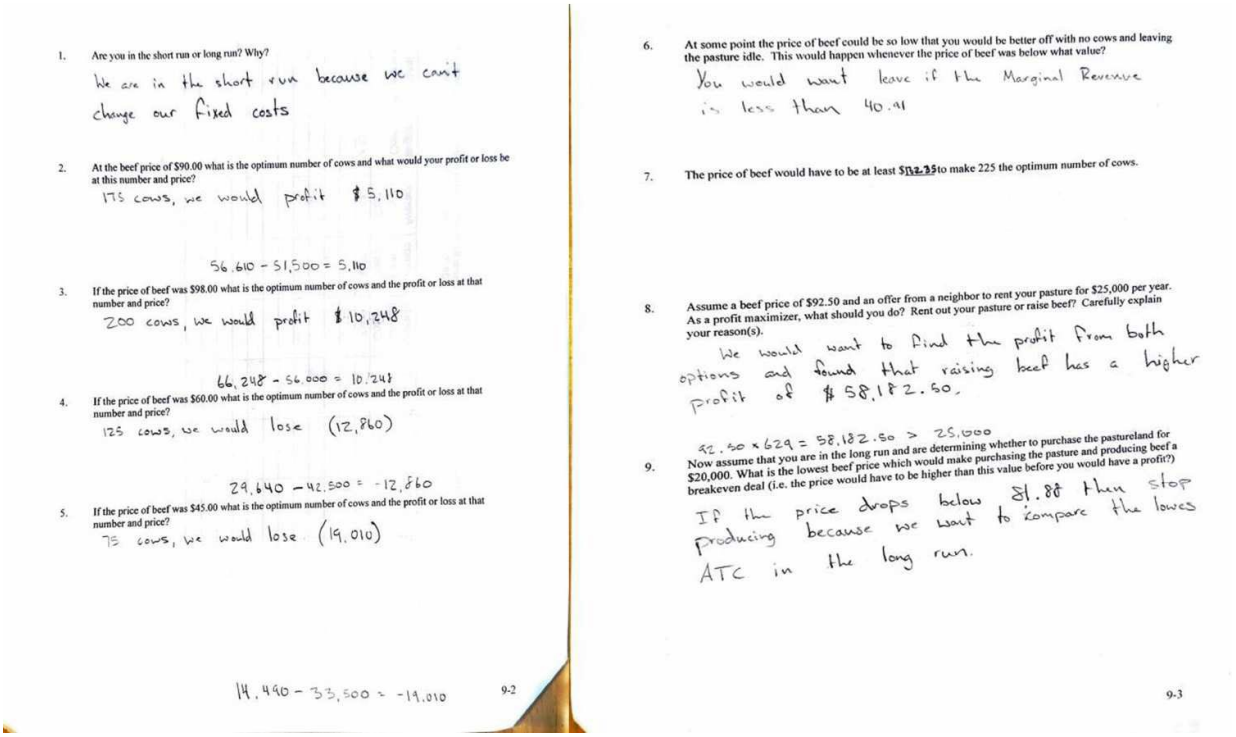
6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
- below $33

7. The price of beef would have to be at least $132 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
- Raising beef will give you a larger profit of $68,182.50 compared to renting it to your neighbor + pasting $25,000 after fixed costs

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
- lowest price beef could be is $81.88

## Student 341-11 (score 3)



1. Are you in the short run or long run? Why?
We are in the short run because we can't change our fixed costs

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
175 cows, we would profit $5,110

56,610 - 51,500 = 5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
200 cows, we would profit $10,248

66,248 - 56,000 = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
125 cows, we would lose (12,860)

29,640 - 42,500 = -12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
75 cows, we would lose (19,010)

14,490 - 33,500 = -19,010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
You would want leave if the Marginal Revenue is less than 40.91

7. The price of beef would have to be at least $~~132~~ 133 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
We would want to find the profit from both options and found that raising beef has a higher profit of $ 58,182.50.

92.50 x 629 = 58,182.50 > 25,000

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
If the price drops below $1.88 then stop producing because we want to compare the lowest ATC in the long run.

9-3

## Student 341-12 (score 1)

1. Are you in the short run or long run? Why?
Short run. This is because some resources are fixed and can't be changed.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
50 cows $49.09

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
60 cows $357.09

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
50 cows $19.09

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
50 cows $4.09

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
When the price is below the variable cost.

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.
$76.92

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
Rent out the pasture, because it would be more profitable.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
$89.04

9-3

## Student 341-13 (score 4)

1. Are you in the short run or long run? Why?
We are in the short-run because there is a fixed cost for the amount of pasture.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
The optimum number of cows is 175 since MR > MC. Your profit is $5,110 at this number.
629 x 90 = 56,610 − 51,500 = 5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
The optimum number of cows is 200 since MR > MC. Your profit is $10,248 at this number.
676 x 98 = 66,248 − 56000 = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
The optimum number of cows is 125 since MR > MC. Your loss is -12,860 at this number
494 x 60 = 29,640 − 42500 = -12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
The optimum number of cows is 75 since MR > MC. Your loss is -19,010 at this number.
322 x 45 = 14,490 − 33,500 = -19,010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
The lowest AVC value which is 40.91, if the price is below this you would be better off with no cows.

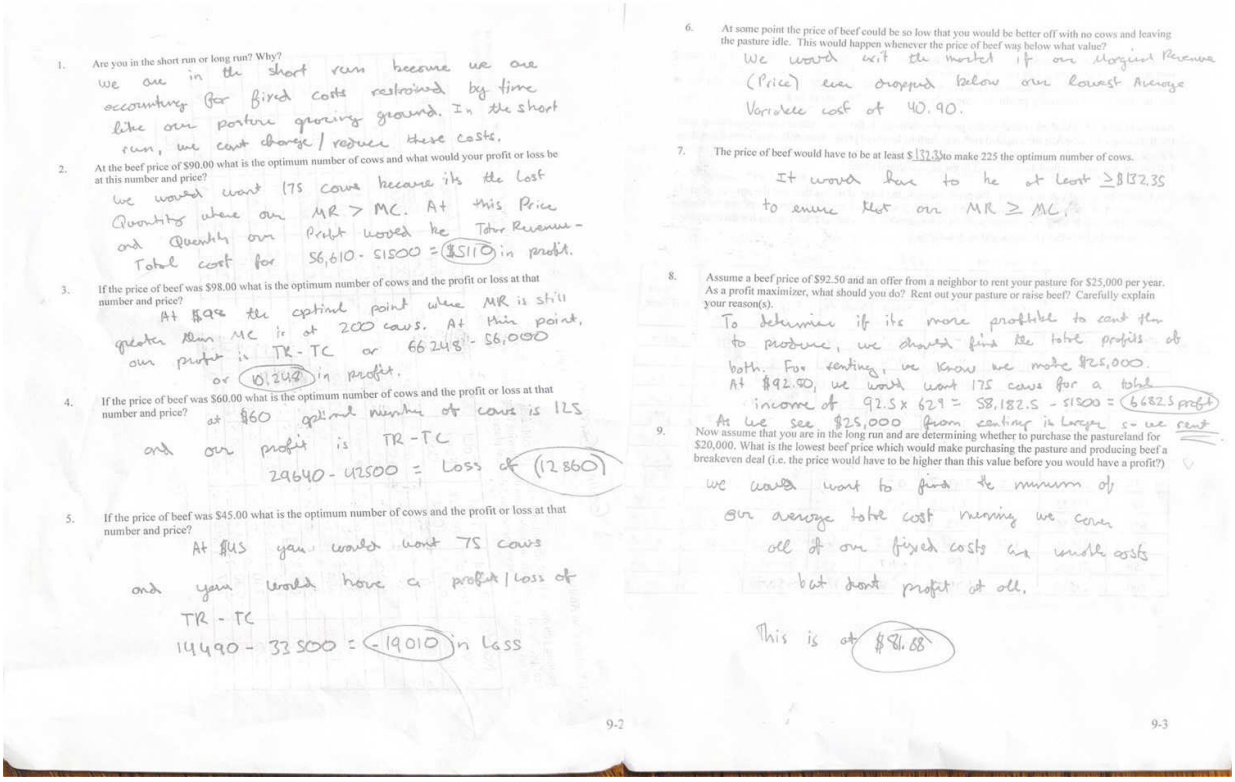
7. The price of beef would have to be at least $132.35 to make 225 the optimum number of cows.
Price would have to be 132.35.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
629 x 92.50 = 58,182.50 − 51,500 = 6,682.50
25,000 − 20,000 = 5,000
You should raise beef because since you have a $20,000 fixed cost your profit would be higher raising beef.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
The lowest beef price would be 81.88 because that's where the ATC is just greater than the MC.

9-3

**Student 341-14 (score 2)**



1. Are you in the short run or long run? Why?
We are in the short run because we are accounting for fixed costs restrained by time like our pasture grazing ground. In the short run, we can't change / reduce these costs.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
We would want 175 cows because it's the last Quantity where our MR > MC. At this Price and Quantity our Profit looked like Total Revenue - Total cost for $6,610 - $1500 = ($5110) in profit.

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
At $98 the optimal point where MR is still greater than MC is at 200 cows. At this point, our profit is TR - TC or 66248 - 56,000 or (10,248) in profit.

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
at $60 optimal number of cows is 125 and our profit is TR - TC
29640 - 42500 = Loss of (12860)

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
At $45 you would want 75 cows and you would have a profit / loss of
TR - TC
14490 - 33500 = -19010 in Loss

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
We would exit the market if our Marginal Revenue (Price) ever dropped below our lowest Average Variable cost of 40.90.

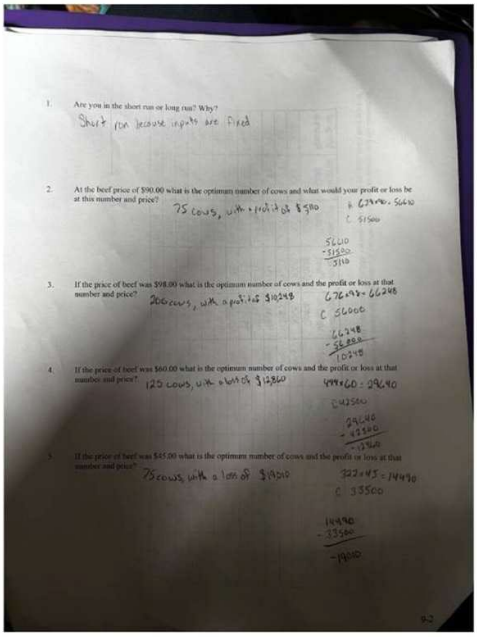
7. The price of beef would have to be at least $132.35 to make 225 the optimum number of cows.
It would have to be at least ≥ $132.35 to ensure that our MR ≥ MC,

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
To determine if it's more profitable to rent than to produce, we should find the total profits of both. For renting, we know we make $25,000. At $92.50, we would want 175 cows for a total income of 92.5 x 629 = 58,182.5 - 51500 = (6682.5 profit)
As we see $25,000 from renting is larger so we rent

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
we would want to find the minimum of our average total cost meaning we cover all of our fixed costs and variable costs but don't profit at all.
This is at $81.88

9-3

**Student 341-15 (score 3)**



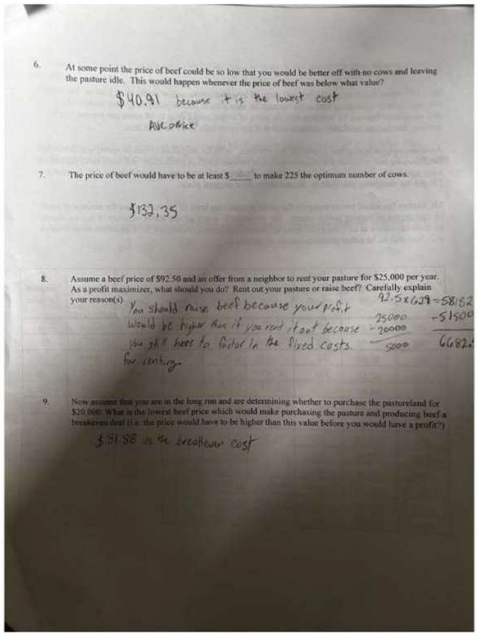
1. Are you in the short run or long run? Why?
Short run because inputs are fixed

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
75 cows, with a profit of $5610

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
200 cows, with a profit of $10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
125 cows, with a loss of $12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
75 cows, with a loss of $19,010



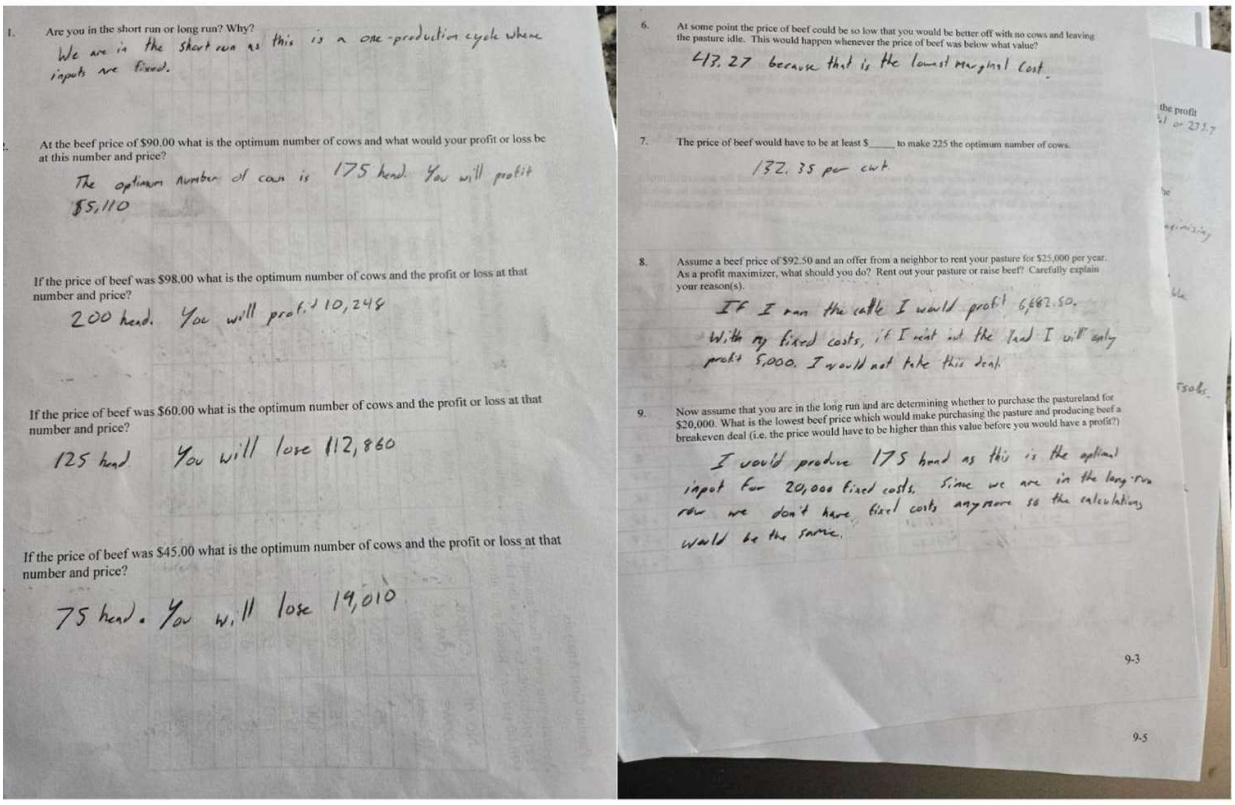
6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
$40.91 because it is the lowest cost
Ave price

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
$139.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
You should raise beef because your profit would be higher than if you rent it out because you still have to factor in the fixed costs for renting.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
$31.88 is the breakeven cost

## Student 341-16 (score 3)



1. Are you in the short run or long run? Why?
We are in the short run as this is a one-production cycle where inputs are fixed.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
The optimum number of cows is 175 head. You will profit $5,110

If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
200 head. You will profit 10,248

If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
125 head You will lose 12,860

If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
75 head. You will lose 19,010

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
17.27 because that is the lowest marginal cost.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
132.35 per cwt

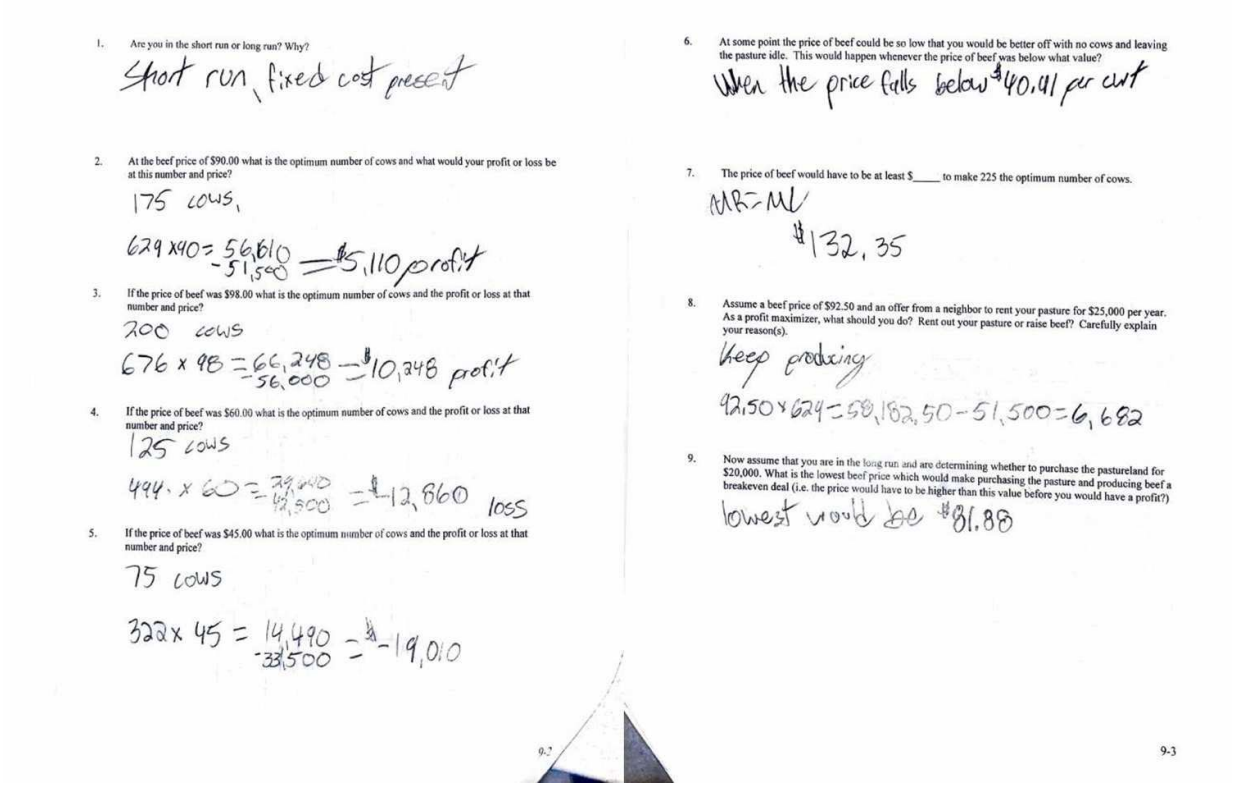
8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
If I run the cattle I would profit 6,682.50. With my fixed costs, if I rent out the land I will only profit 5,000. I would not take this deal.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
I would produce 175 head as this is the optimal input for 20,000 fixed costs. Since we are in the long-run we don't have fixed costs anymore so the calculations would be the same.

9-3

9-5

## Student 341-17 (score 3)



1. Are you in the short run or long run? Why?

short run, fixed cost present

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 cows,

629 x 90 = 56,610 − 51,500 = $5,110 profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows

676 x 98 = 66,248 − 56,000 = $10,248 profit

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows

494 x 60 = 29,640 − 42,500 = −$12,860 loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows

322 x 45 = 14,490 − 33,500 = −$19,010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

When the price falls below $40.41 per cwt

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

MR = MC

$132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

keep producing

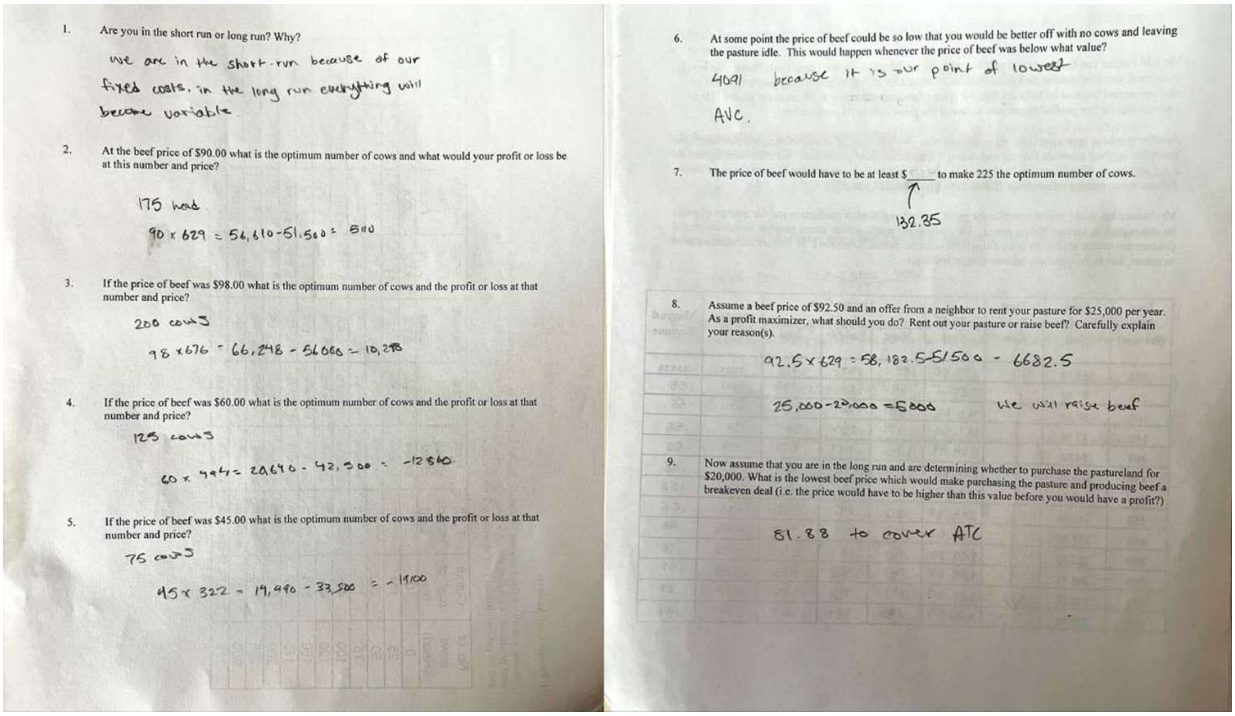
92.50 x 624 = 58,182.50 − 51,500 = 6,682

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

lowest would be $81.88

9-3

## Student 341-18 (score 3)



1. Are you in the short run or long run? Why?

we are in the short-run because of our fixed costs. in the long run everything will become variable.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 head

90 x 629 = 56,610 − 51,500 = 5110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows

98 x 676 = 66,248 − 56,000 = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows

60 x 494 = 29,640 − 42,500 = −12860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows

45 x 322 = 14,490 − 33,500 = −19100

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

40.91 because it is our point of lowest AVC.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

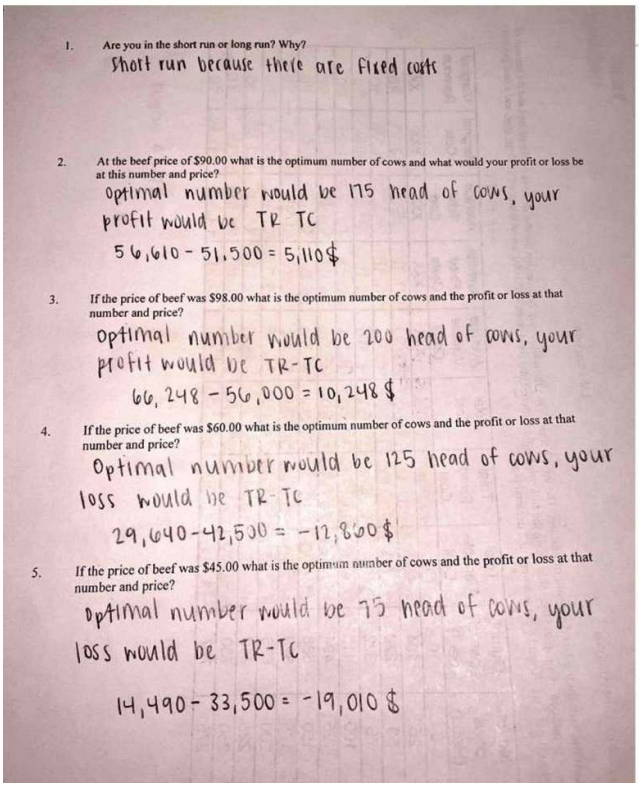
92.5 x 629 = 58,182.5 − 51500 = 6682.5

25,000 − 20,000 = 5000 We will raise beef

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

81.88 to cover ATC

## Student 341-19 (score 4)



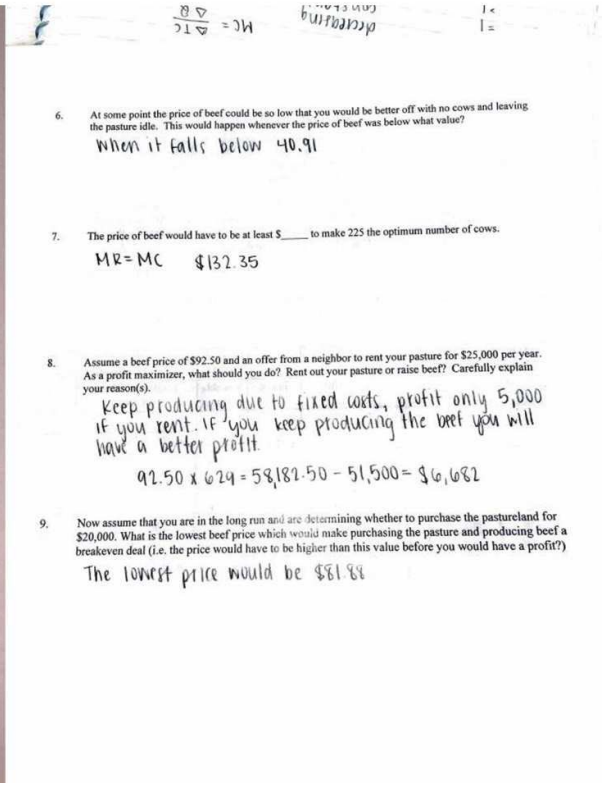
1. Are you in the short run or long run? Why?
Short run because there are fixed costs

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
optimal number would be 175 head of cows, your profit would be TR TC
56,610 - 51,500 = 5,110$

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
optimal number would be 200 head of cows, your profit would be TR-TC
66,248 - 56,000 = 10,248 $

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
Optimal number would be 125 head of cows, your loss would be TR-TC
29,640-42,500 = -12,860 $

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
optimal number would be 75 head of cows, your loss would be TR-TC
14,490 - 33,500 = -19,010 $



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
When it falls below 40.91

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
MR=MC $132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
Keep producing due to fixed costs, profit only 5,000 if you rent. If you keep producing the beef you will have a better profit
92.50 x 624 = 58,182.50 - 51,500 = $6,682

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
The lowest price would be $81.88

## Student 341-20 (score 2)

1. Are you in the short run or long run? Why?

We are in the Short-run

Because our price is always greater than our AVC, which means we can produce to where our price is greater than our ATC, we can Make this hbk

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

Optimum # of Cows would be at 175-200 hd. Where we would profit $5,110 - $4,840

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

optimum # of Cows would be 200-225 hd where we would profit $10,248 - $9,060

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

optimum # of Cows would be ≈ 150 hd With a loss of ≈ $(12,920)

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum # of Cows would be ≈ 75 hd With a loss of ≈ $(19,010)



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

This would happen where price of Beef is Below $38.79 per cwt.

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.

$132.35 to make 225 optimum # of Cows

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

at price of $92.50 we would Raise 175-200 hd For a Revenue of $58,182.5 - $62,530.00, The Rent would Raise our Fixed Costs by $5000 meaning we would Expect $56,500 - 61,000 in Total Cost, leaving us making ≈ $1,682.50 - 1,530 Would be Better Raising them at Home Place Dont Rent

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

long-run = Price > ATC to Continue producing. This coinciding with our given table suggests already a fix Cost of $20,000, Safe to Assume this land deal as given For this Amount, Meaning the lowest our Beef price could be would be the Min(ATC) which is $81.88



## Student 341-21 (score 3)

1. Are you in the short run or long run? Why?

Short run. We have a fixed variable.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

Optimum # of cows is 175 and profit is $5,110.

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum # of cows is 200 and profit is $10,248.

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum # of cows is 125 and a loss of $12,860.

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum # of cows is 75 and a loss of $19,010.



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

You would exit if MR was lower than $40.91

7. The price of beef would have to be at least $132.35 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

You would want to produce beef because 6,682.50>5,000 since 20,000 is a fixed cost.

25,000 − 20,000 FC = 5,000

175 cows × 1029 = 58,817.5 − 51,500 = 6,682.50

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

ATC

In the long run, you would be able to cover your variable cost until $81.88 (lowest ATC) and you would no longer want to produce.

## Student 341-22 (score 4)

1. Are you in the short run or long run? Why?

Short run, We have Fixed costs

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 cows, 629 (90) = $ 56,610

56,610 - 51,500 = $ 5,110 profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows, 676 (98) = $66,248

66,248 - 56,000 = $ 10,248 profit

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows, 444 (60) = $ 29,640

29,640 - 42,500 = - $12,860 Loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows, 322 (45) $14,490

14,490 - 33,500 = - $ 19,010 Loss

9-2

II. Profit Maximization for Cotton

Mr. I.M Farmer has been producing 500 acres of irrigated cotton in the Texas High Plains. He is very concerned about increasing fuel costs because he uses a lot of fuel to pump irrigation water. He is also concerned because he believes that the price of cotton could drop to 58 cents per pound. He is not sure that he can profitably produce cotton if the price falls to 58 cents or less.

Assume you have been asked to analyze this problem. With the help of an extension agent, you developed the following cost schedule for irrigated cotton at various levels of production. All costs were figured on a per acre basis. Fixed costs are $110 per acre. Total variable costs per acre are listed in the chart below. Fill out the remaining calculations. Round to the third decimal place.

Mr. Farmer has asked you to compute the profit maximizing level of production and the amount of profit he can expect at various cotton prices. He particularly wants advice about whether or not he should produce any cotton at all if the price drops to 58 cents per pound. (Assume I. M. Farmer has no alternative to cotton; that is, he either produces cotton or nothing.)

| Total Prod (lbs/acre) | Total Variable Cost | Total Fixed Cost | Total Cost | Average Cost Per Lb | | | Marginal Cost | Marginal Revenue |
|---|---|---|---|---|---|---|---|---|
| | | | | Fixed | Variable | Total | | |
| 200 | $65.80 | $110 | $175.80 | $0.550 | $0.329 | $0.879 | xxxx | xxxxx |
| 250 | 77.00 | 110 | 187.00 | 0.440 | 0.308 | 0.748 | 0.224 | 0.58 |
| 300 | 80.68 | 110 | 190.68 | 0.367 | 0.269 | 0.636 | 0.074 | 0.58 |
| 350 | 87.59 | 110 | 197.59 | 0.314 | 0.250 | 0.565 | 0.135 | 0.58 |
| 400 | 94.94 | 110 | 204.94 | 0.275 | 0.237 | 0.512 | 0.147 | 0.58 |
| 450 | 103.80 | 110 | 213.80 | 0.244 | 0.231 | 0.475 | 0.177 | 0.58 |
| 500 | 115.30 | 110 | 225.30 | 0.220 | 0.231 | 0.451 | 0.230 | 0.58 |
| 550 | 133.30 | 110 | 243.30 | 0.200 | 0.242 | 0.442 | 0.360 | 0.58 |
| 600 | 155.55 | 110 | 265.55 | 0.183 | 0.259 | 0.443 | 0.445 | 0.58 |
| 650 | 182.80 | 110 | 292.80 | 0.169 | 0.281 | 0.450 | 0.545 | 0.58 |
| 700 | 215.55 | 110 | 325.55 | 0.157 | 0.308 | 0.465 | 0.655 | 0.58 |
| 750 | 254.30 | 110 | 364.30 | 0.147 | 0.339 | 0.486 | 0.775 | 0.58 |
| 800 | 295.80 | 110 | 405.80 | 0.138 | 0.370 | 0.507 | 0.830 | 0.58 |

9-4

1. What is the most profitable cotton yield if the price is 80 cents per pound ($0.80)? What is the profit or loss per acre?

750 lbs/acre

600 - 364.30 = $ 235.70 profit per acre

2. If the price falls to 58 cents per pound, should Mr. Farmer produce any cotton? If yes, what is the profit maximizing yield per acre and the resulting profit per acre? If no, what is the loss per acre?

Yes, produce 650 lbs/acre

377 - 292.80 = $ 84.20 profit per acre

3. How much would Mr. Farmer lose if he did not produce any cotton some year (per acre and total)?

110 (500) = $ 55,000 loss total

$110 loss per acre

4. If the expected price is only 40 cents per pound, should Mr. Farmer try to produce anything? If yes, what is the profit maximizing yield per acre and the resulting profit/loss per acre? If no, what is the loss per acre?

Yes, produce at 550 lbs/acre (Price ≥ AVC)

220 - 243.30 = $23.30 loss per acre

5. What is the lowest price that Mr. Farmer can receive and just cover all his costs? At what yield?

Price = ATC

$0.442 @ 550 lbs/acre

6. At what price will Mr. Farmer stop producing?

Shut down as soon as Price falls below min AVC

Stop producing if price falls below $0.231 per lb

9-5

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

If AVC > Price, don't produce

If price falls below $40.91, don't produce

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

MR=MC

MC @ 225 cows = $132.35

MR would have to be $132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

| Rent profit | Beef Profit |
|---|---|
| 25,000 - 20000 | 629 (92.50) - $58,182.50 |
| = $5,000 | 58,182.50 - 51,500 |
| | = $ 6,682 (Keep producing) |

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

Price = Lowest ATC

Price = $ 81.88

9-3

### III. Calculating Ownership Costs

Happy Harvesters, Inc. owns a large combine. They know how much their costs are for fuel, repairs and labor, but they need help calculating their current ownership costs, so they can tell if the custom rates they charge for combining are high enough. Here are their facts:

**Current Year**

- The estimated current value of the combine and harvesting heads is $250,000.
- They have $150,000 borrowed from the bank at a 6% annual interest rate.
- They have $100,000 of their own (equity) capital invested, with a 4% opportunity cost.
- Depreciation is 10% each year.
- Taxes and insurance costs are 1% of the combine value.

1. What is their average interest rate (weighted cost of capital)? Hint, find the weighted average using share of capital at each interest rate.

100,000/250,000 = 0.4 (0.6 x 0.6) + (0.4 x 0.4) = 5.2%

100,000/250,000 = 0.4

2. What is their annual interest cost?

250,000 (0.52) = $13,000

3. What is their annual depreciation?

250,000 (0.10) = $25,000

4. What are their taxes and insurance costs?

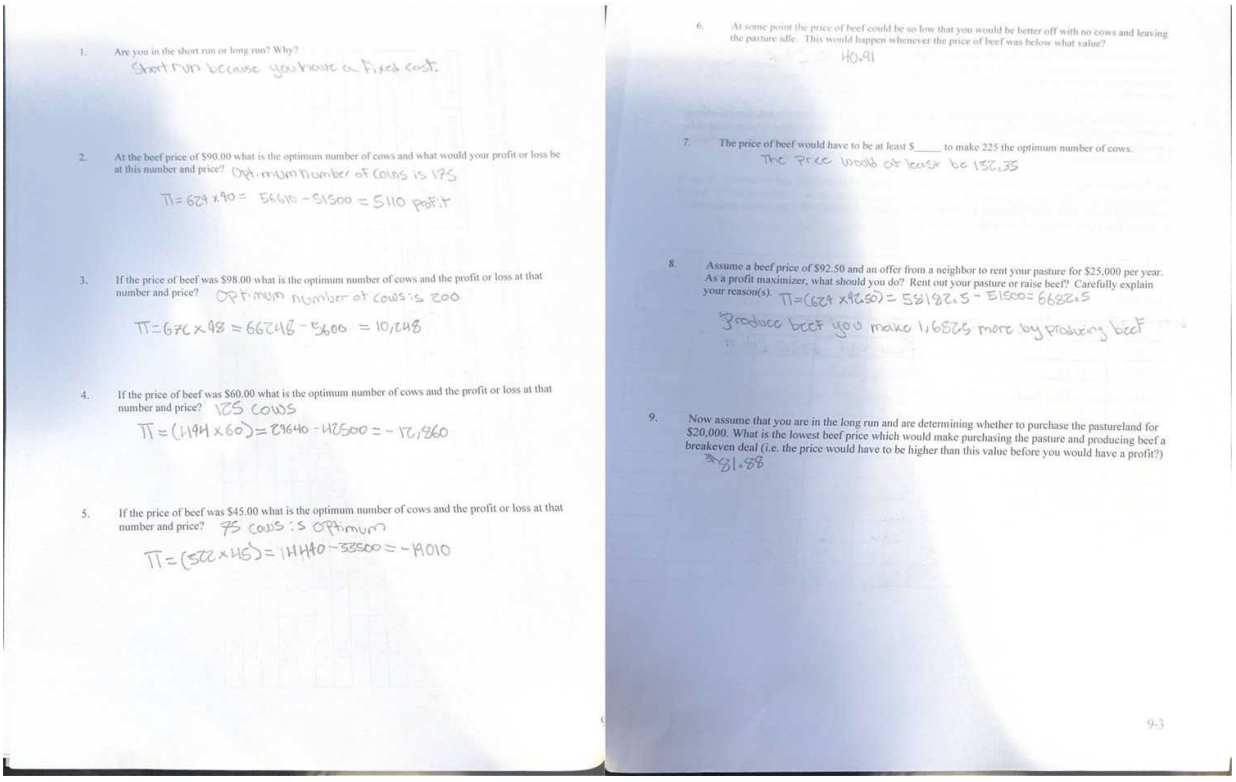
250,000 (0.01) = $ 2,500

5. What are the total ownership costs in the current year?

13,000 + 25,000 + 2500 = $ 40,500

9-6

## Student 341-23 (score 4)



1. Are you in the short run or long run? Why?
Short run because you have a Fixed cost.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price? Optimum Number of cows is 175
$\Pi = 624 \times 90 = 56610 - 51500 = 5110$ profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price? Optimum number of cows is 200
$\Pi = 678 \times 98 = 66248 - 56000 = 10,248$

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price? 125 cows
$\Pi = (1194 \times 60) = 29640 - 42500 = -12,860$

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price? 75 cows is optimum
$\Pi = (522 \times 45) = 11440 - 33500 = -19,010$

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
40.91

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
The price would at least be 150.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s). $\Pi = (624 \times 92.50) = 58182.5 - 51500 = 6682.5$
Produce beef you make 1,682.5 more by producing beef

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
31.58

9-3

## Student 341-24 (score 4)





1. Are you in the short run or long run? Why?

All these decisions are being made in the short run because there's a fixed cost column. Because of the endless possibilities when it comes to production decisions, all long-term decisions are made with exclusively variable costs. The implication of fixed costs implies that it's "too late" to change anything and thus the cost is fixed- you have to pay $20,000 weather you like it or not. If this was a long run decision that $20,000 is something you could choose to get out of- it wouldn't be fixed because you could get rid of whatever was incurring it.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 head of cows would be the profit maximizing point because your Marginal Costs are $73.77 per cow while your margin revenue is $90.00 per cow. At this price per cwt. You would have a profit of $5,110.00.

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

The optimum number of cows would be 200 with a marginal cost per cow of $95.74 and a total profit of $10,248.

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

The optimum number of cows at a price of $60.00 per cwt. would be 125 at a total loss of $12,860. While this is a significant loss, it's less than the fixed costs of $20,000- so it would be a preferred solution to not producing cows at all.

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

The optimum number of cows at $45.00 cwt would be 75 with a total loss of $19,010. This is pretty darn close to your fixed costs but would technically be preferred.



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

You at a bare minimum want to cover your AVC, your fixed costs are already sunk- so we won't focus on that. But *if* we are going to produce, we *will be incurring variable costs* so thus the lowest price for beef can't be less than our *lowest AVC*. This would mean we wouldn't produce if our price of beef (or our MR) was below $40.91.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

The profit maximizing decision for when to produce is when MC = MR. If we have a fixed rate for the price of beef, that will imply our MR = our price. So, to make 225 the optimum number of cows, you would want your price to be $132.35.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

We are in the short term- we've already sunk $20,000 in fixed cost into this pasture so our profit from renting this pasture would be $5,000.

For this to be the wisest decision, our profit off beef priced at $92.50 would have to be less.

If the price of beef is $92.50, you would have a profit of $6,682.50.

*So, you would want to produce beef.*

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

When you're in the short run you want to cover your variable cost but when you in the long run you want to be covering that total cost. In the long run, for a business to survive, it needs to be able to cover *all* its expenses. The price would have to be higher than $81.88, because at this point you would only be making a profit of $2.52. If we dropped that price by even a penny (to $81.87) we would be operating at a *loss* of $3.77.



## Student 341-25 (score 4)

1. Are you in the short run or long run? Why?

Short run because this is [illegible] (fixed cost are short-run (fixed [illegible]) (long run all costs are variable)

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 head

561610
-51500
$5110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 head

662 48
-516000
$10 248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 head

29640
-42500
-12 860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 head

14 490
-33 500
$-19,010



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6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

Lowest AVC = 40.91

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

$132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

If you rent → $5000 profit

Raise beef → $92.50 · 629 = 58182.5 − 51500 = $6682.5

25000 − 20000 = 5000

*more profit by selling beef

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

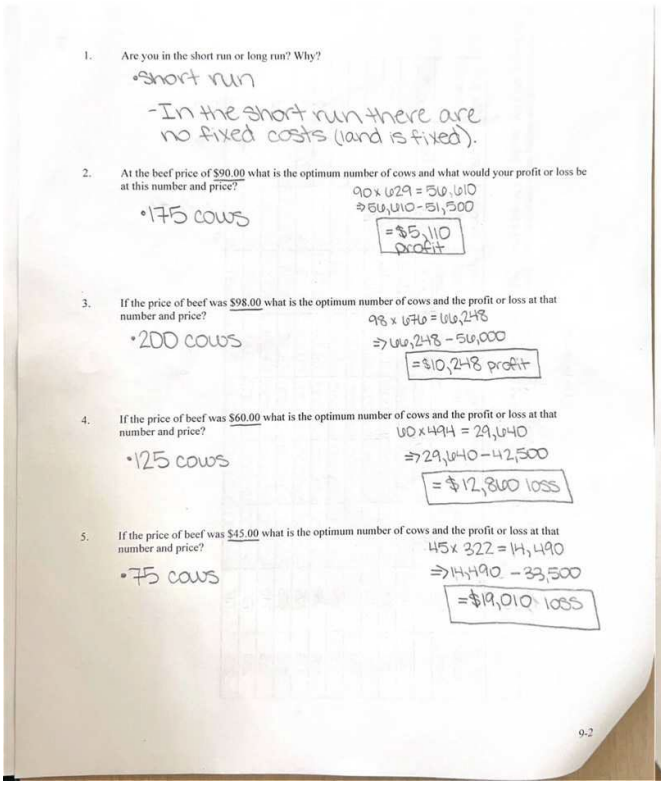
ATC Lowest = 81.88

long-term → no fixed cost



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## Student 341-26 (score 3)



1. Are you in the short run or long run? Why?

•Short run

-In the short run there are no fixed costs (land is fixed).

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

•175 cows

90 x 629 = 56,610
⇒ 56,610 - 51,500
= $5,110 profit

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

•200 cows

98 x 676 = 66,248
⇒ 66,248 - 56,000
= $10,248 profit

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

•125 cows

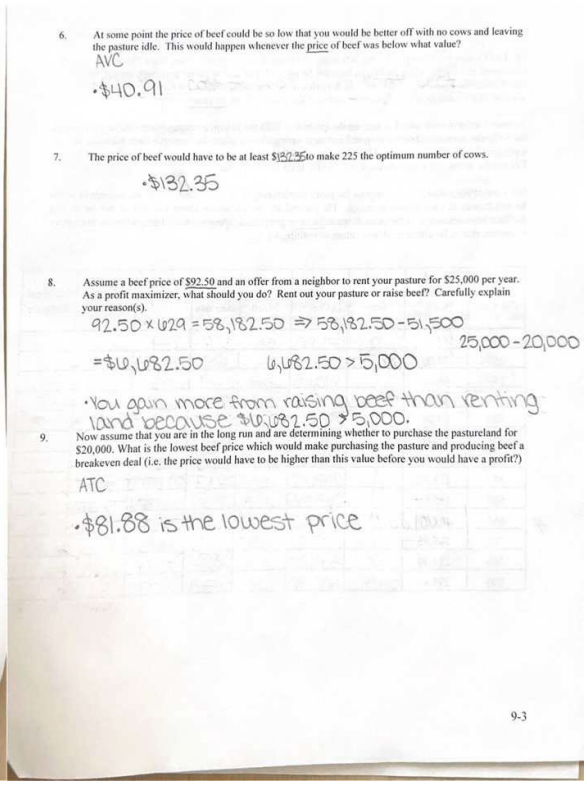
60 x 494 = 29,640
⇒ 29,640 - 42,500
= $12,860 loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

•75 cows

45 x 322 = 14,490
⇒ 14,490 - 33,500
= $19,010 loss

9-2



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

AVC

•$40.91

7. The price of beef would have to be at least $132.35 to make 225 the optimum number of cows.

•$132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

92.50 x 629 = 58,182.50 ⇒ 58,182.50 - 51,500
= $6,682.50 6,682.50 > 5,000
25,000 - 20,000

•You gain more from raising beef than renting land because $6,682.50 > 5,000.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

ATC

•$81.88 is the lowest price

9-3

## Student 341-27 (score 3)

1. Are you in the short run or long run? Why?

a short run
cause we have a fixed variable

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

optimum number of cows is 175 & profit is $ 5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

optimum number of cows is 200
& profit is $ 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

optimum number of cows is 125
& a loss of $ 12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

optimum number of cows is 75
& a loss of $ 19,010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

you would exit if MR was lower than $ 40.91

7. The price of beef would have to be at least $132.35 to make 225 the optimum number of cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

you would want to produce beef because 6,682.50 > 5,000 since 20,000 is a fixed cost

25000
- 20000
5000

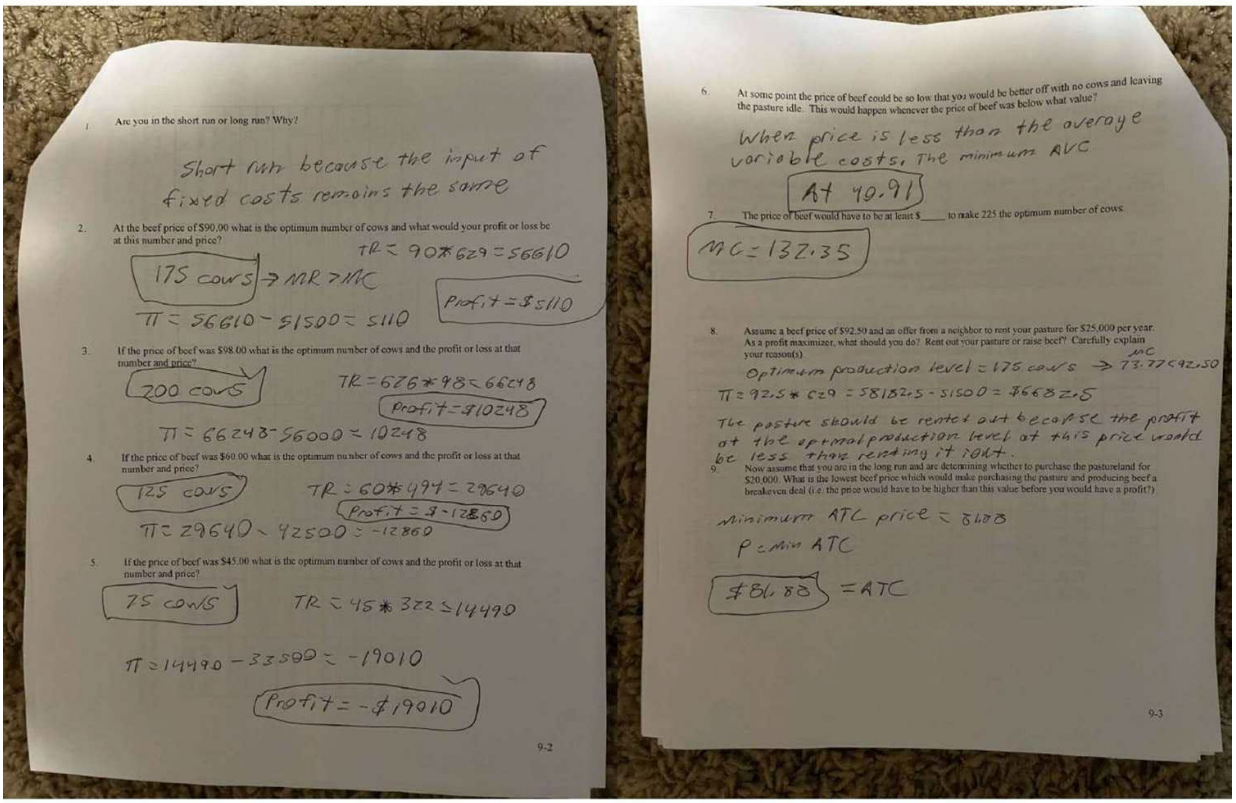
175 cows
x 629
58,182.5 -
51,500
= 6,682.50

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

in the long run, you'd be able to cover your variable cost until $ 81.88 (lowest ATC) & you'd no longer want to produce

9-3

**Student 341-28 (score 2)**



1. Are you in the short run or long run? Why?

Short run because the input of fixed costs remains the same

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

TR = 90*629 = 56610

175 cows → MR > MC

Profit = $5110

π = 56610 - 51500 = 5110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows

TR = 626*98 = 66248

Profit = $10248

π = 66248 - 56000 = 10248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows

TR = 60*494 = 29640

Profit = $-12860

π = 29640 - 42500 = -12860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows

TR = 45*322 = 14490

π = 14490 - 33500 = -19010

Profit = -$19010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

When price is less than the average variable costs. The minimum AVC

At 49.91

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.

MC = 132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s)

Optimum production level = 175 cows → MC 73.77 92.50

π = 92.5*629 = 58182.5 - 51500 = 6682.5

The pasture should be rented out because the profit at the optimal production level at this price would be less than renting it out.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

Minimum ATC price = $ATC

P = Min ATC

$81.88 = ATC

9-3

**Student 341-29 (score 4)**

1. Are you in the short run or long run? Why?

Short run because we have fixed costs.
land

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

175 is the optimum number of cows. Profit would be
56,610 - 51,500 = 5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 is the optimum number. Profit would be
66,248 - 56,000 = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 is the optimum #. Profit would be
29,640 - 42,500 = -12,860 so a (-) profit = loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 is the optimum #. Profit would be
14,490 - 33,500 = -19,010 so (-) profit = loss

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

$40.91 because he needs to cover his lowest AVC.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

$132.35 because that is the MC and profit maximizing is MC = MR

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

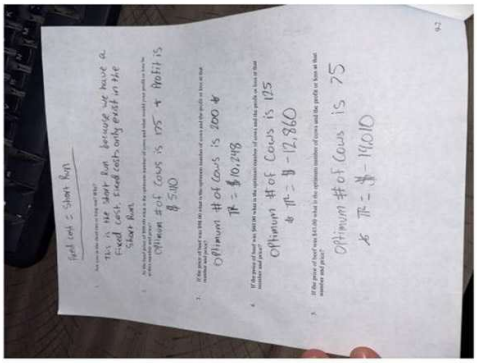
You will keep producing because you still have fixed costs of $20,000. This means your profit from renting is $5,000 and profit with new price of beef is (92.50)(629) = 58,182.5
58,182.5 - 51,500 = 6,682.50 → this is higher.

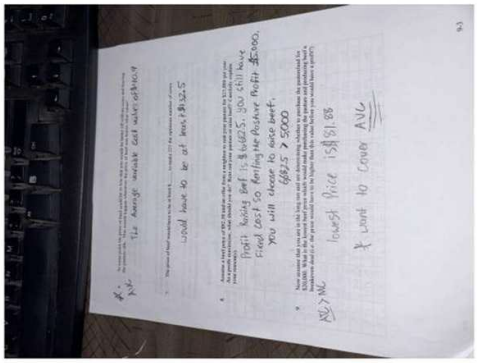
9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

$81.88 because ATC is just greater than MC. ATC and AVC are now the same because we are in the long run.

9-3

## Student 341-30 (score 3)



## Student 341-31 (score 2)

1. Are you in the short run or long run? Why?

Are in the short run bc fixed cost is constant 20,000.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price? MR = MC TR - TC

Optimum = 175

Profit = $5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum = 200

Profit = $ 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum = 125

Loss = $12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

Optimum = 75

Loss = $19,010



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

$ 40.91 Look at AVC

covers AVC

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.

$132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Yes rent pasture: the rent covers your fixed cost & have 5,000 left over.
Raise beef: optimum of 175 hd & profit = $ 6682.50

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

In the long run, the lowest beef price would be $81.88 for the breakeven deal.



## Student 341-32 (score 3)

**Ownership Costs in the Long Run**

They can trade for a new combine for a cost of $400,000, including the value of their old machine that would be used as a trade-in. The useful life of the new combine is expected to be 8 years with a salvage value of $120,000. Assume the interest and tax and insurance rates stay the same. The depreciation rate needs to be recalculated using the straight line method. **Make sure that when you find the long run ownership costs, you use the average value (ie questions 7-9)!**

6. What is the average value of the combine over 8 years?

(400,000 + 120,000) / 2 = 260,000

7. What is their annual interest cost?

260,000 × 5.2% = 13,520

8. What is their annual depreciation?

(400,000 - 12,000) / 8 = 35,000

9. What are the taxes and insurance costs?

260,000 × 0.01 = 2,600

10. What are the total ownership costs in the current year? What is the share of annual fixed costs relative to the purchase price?

13,520 + 35,000 + 2600 = 51,120

51120 / 400,000 = 12.78%

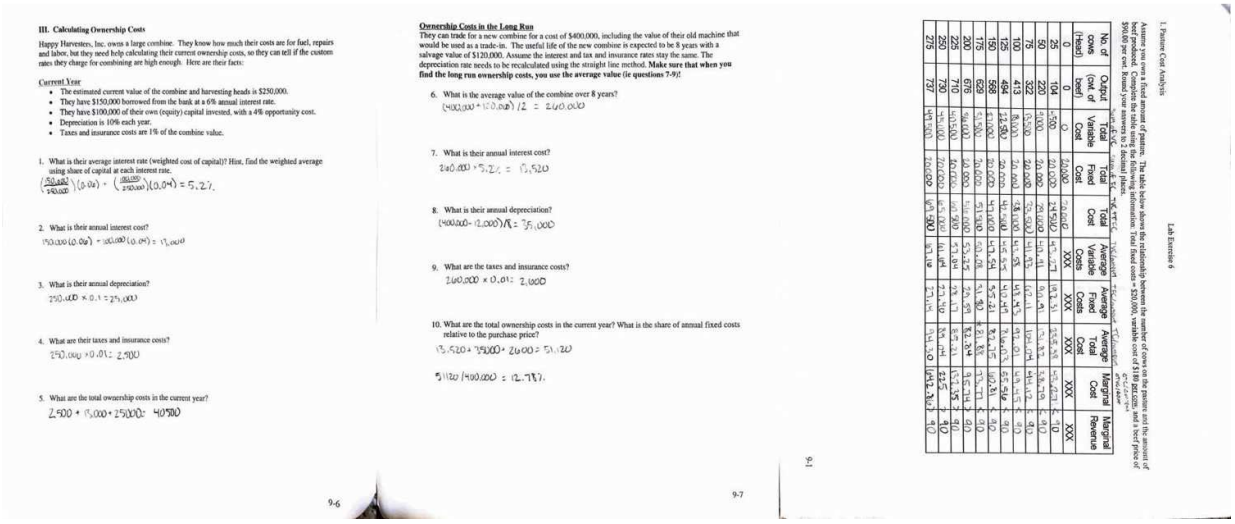


1. Pasture Cost Analysis

Lab Exercise 6

Assume you own a fixed amount of pasture. The table below shows the relationship between the number of cows on the pasture and the amount of beef produced. Complete the table using the following information: Total fixed costs = $20,000, variable cost of $180 per cow, and a beef price of $90.00 per cwt. Round your answers to 2 decimal places.

| No. of cows (Head) | Output (cwt. of beef) | Total Variable Cost | Total Fixed Cost | Total Cost | Average Variable Costs | Average Fixed Costs | Average Total Cost | Marginal Cost | Marginal Revenue |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 20000 | 20000 | XXX | XXX | XXX | XXX | XXX |
| 25 | 104 | 4500 | 20,000 | 24500 | 43.27 | 192.31 | 235.58 | 43.27 | $ 90 |
| 50 | 220 | 9000 | 20,000 | 29000 | 40.91 | 90.91 | 131.82 | 38.79 | $ 90 |
| 75 | 322 | 13500 | 20,000 | 33500 | 41.93 | 62.11 | 104.04 | 44.12 | $ 90 |
| 100 | 413 | 18,000 | 20,000 | 38,000 | 43.53 | 48.43 | 91.01 | 49.45 | $ 90 |
| 125 | 494 | 22500 | 20,000 | 42500 | 45.55 | 40.49 | 86.03 | 55.56 | $ 90 |
| 150 | 568 | 27000 | 20,000 | 47000 | 47.54 | 35.21 | 82.75 | 60.81 | $ 90 |
| 175 | 629 | 31500 | 20,000 | 51500 | 50.08 | 31.80 | 81.88 | 72.77 | $ 90 |
| 200 | 676 | 36000 | 20,000 | 56,000 | 53.25 | 29.59 | 82.84 | 95.24 | $ 90 |
| 225 | 710 | 40500 | 20,000 | 60500 | 57.04 | 28.17 | 85.21 | 132.35 | $ 90 |
| 250 | 730 | 45000 | 20,000 | 65,000 | 61.64 | 27.40 | 89.04 | 225 | $ 90 |
| 275 | 737 | 49500 | 20000 | 69,500 | 67.16 | 27.14 | 94.30 | 1642.86 | $ 90 |



**III. Calculating Ownership Costs**

Happy Harvesters, Inc. owns a large combine. They know how much their costs are for fuel, repairs and labor, but they need help calculating their current ownership costs, so they can tell if the custom rates they charge for combining are high enough. Here are their facts:

Current Year
- The estimated current value of the combine and harvesting heads is $250,000.
- They have $150,000 borrowed from the bank at a 6% annual interest rate.
- They have $100,000 of their own (equity) capital invested, with a 4% opportunity cost.
- Depreciation is 10% each year.
- Taxes and insurance costs are 1% of the combine value.

1. What is their average interest rate (weighted cost of capital)? Hint, find the weighted average using share of capital at each interest rate.
$\left(\frac{150,000}{250,000}\right)(0.06) + \left(\frac{100,000}{250,000}\right)(0.04) = 5.2\%$

2. What is their annual interest cost?
$150,000(0.06) + 100,000(0.04) = 13,000$

3. What is their annual depreciation?
$250,000 \times 0.1 = 25,000$

4. What are their taxes and insurance costs?
$250,000 \times 0.01 = 2,900$

5. What are the total ownership costs in the current year?
$2,500 + 13,000 + 25,000 = 40,500$

9-6

**Ownership Costs in the Long Run**

They can trade for a new combine for a cost of $400,000, including the value of their old machine that would be used as a trade-in. The useful life of the new combine is expected to be 8 years with a salvage value of $120,000. Assume the interest and tax and insurance rates stay the same. The depreciation rate needs to be recalculated using the straight line method. **Make sure that when you find the long run ownership costs, you use the average value (ie questions 7-9)!**

6. What is the average value of the combine over 8 years?
$(400,000 + 120,000)/2 = 260,000$

7. What is their annual interest cost?
$260,000 \times 5.2\% = 13,520$

8. What is their annual depreciation?
$(400,000 - 120,000)/8 = 35,000$

9. What are the taxes and insurance costs?
$260,000 \times 0.01 = 2,600$

10. What are the total ownership costs in the current year? What is the share of annual fixed costs relative to the purchase price?
$13,520 + 35,000 + 2,600 = 51,120$

$51,120 / 400,000 = 12.78\%$

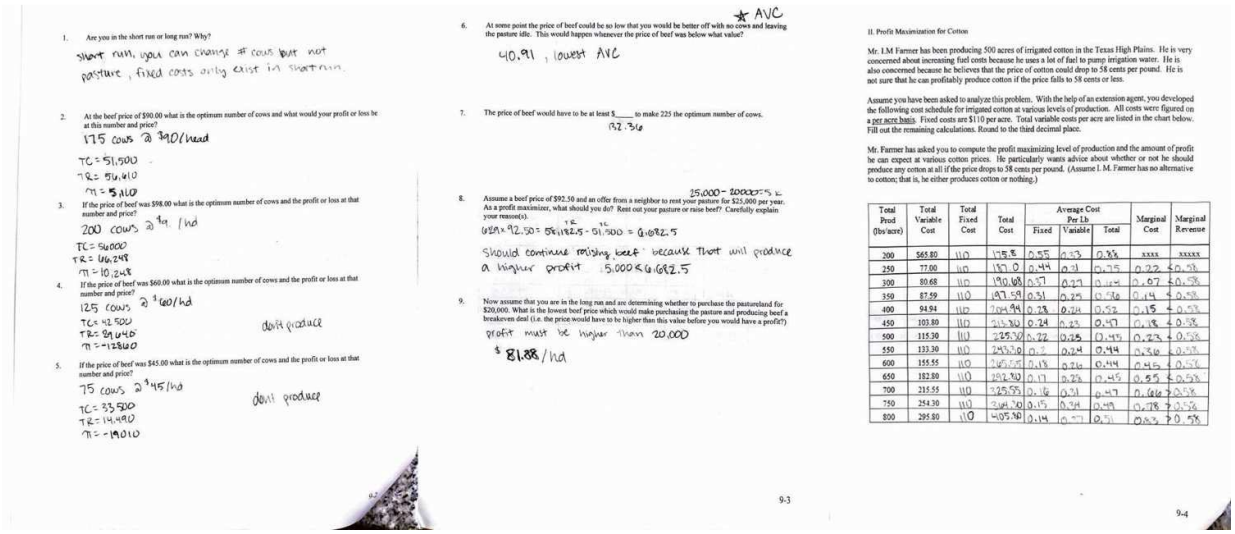
9-7

I. Pasture Cost Analysis

Assume you own a fixed amount of pasture. The table below shows the relationship between the number of cows on the pasture and the amount of beef produced. Complete the table using the following information: Total fixed costs = $20,000, variable cost of $100 per cow, and a beef price of $90.00 per cwt. Round your answers to 2 decimal places.

| No. of cows (Head) | Output (cwt. of beef) | Total Variable Cost | Total Fixed Cost | Total Cost | Average Variable Costs | Average Fixed Costs | Average Total Cost | Marginal Cost | Marginal Revenue |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 20,000 | 20,000 | XXX | XXX | XXX | XXX | XXX |
| 25 | 104 | 2,500 | 20,000 | 22,500 | 24.04 | 192.31 | 216.35 | 0.90 | 90 |
| 50 | 220 | 5,000 | 20,000 | 25,000 | 22.73 | 90.91 | 113.64 | 0.90 | 90 |
| 75 | 322 | 7,500 | 20,000 | 27,500 | 23.29 | 62.11 | 85.40 | 0.90 | 90 |
| 100 | 413 | 10,000 | 20,000 | 30,000 | 24.21 | 48.43 | 72.64 | 0.90 | 90 |
| 125 | 494 | 12,500 | 20,000 | 32,500 | 25.30 | 40.48 | 65.79 | 0.90 | 90 |
| 150 | 568 | 15,000 | 20,000 | 35,000 | 26.41 | 35.21 | 61.62 | 0.90 | 90 |
| 175 | 629 | 17,500 | 20,000 | 37,500 | 27.82 | 31.80 | 59.62 | 0.90 | 90 |
| 200 | 676 | 20,000 | 20,000 | 40,000 | 29.59 | 29.59 | 59.17 | 0.90 | 90 |
| 225 | 710 | 22,500 | 20,000 | 42,500 | 31.69 | 28.17 | 59.86 | 0.90 | 90 |
| 250 | 730 | 25,000 | 20,000 | 45,000 | 34.25 | 27.40 | 61.64 | 0.90 | 90 |
| 275 | 737 | 27,500 | 20,000 | 47,500 | 37.31 | 27.14 | 64.45 | 0.90 | 90 |

9-1



1. Are you in the short run or long run? Why?
short run, you can change # cows but not pasture, fixed costs only exist in short run.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
175 cows @ 90/head
TC = 51,500
TR = 51,610
$\pi$ = 5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
200 cows @ 98/hd
TC = 56000
TR = 66,248
$\pi$ = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
125 cows @ 60/hd
TC = 42,500
TR = 29,640
$\pi$ = -12860
don't produce

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
75 cows @ 45/hd
TC = 33,500
TR = 14,490
$\pi$ = -19,010
don't produce

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
★ AVC
40.91, lowest AVC

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.
92.36

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
25,000 - 20,000 = 5
$TR$
$925 \times 92.50 = 51,182.5 - 51,500 = 6,682.5$
Should continue raising beef because that will produce a higher profit 5,000 < 6,682.5

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
profit must be higher than 20,000
$81.88/hd

9-3

II. Profit Maximization for Cotton

Mr. I.M Farmer has been producing 500 acres of irrigated cotton in the Texas High Plains. He is very concerned about increasing fuel costs because he uses a lot of fuel to pump irrigation water. He is also concerned because he believes that the price of cotton could drop to 58 cents per pound. He is not sure that he can profitably produce cotton if the price falls to 58 cents or less.

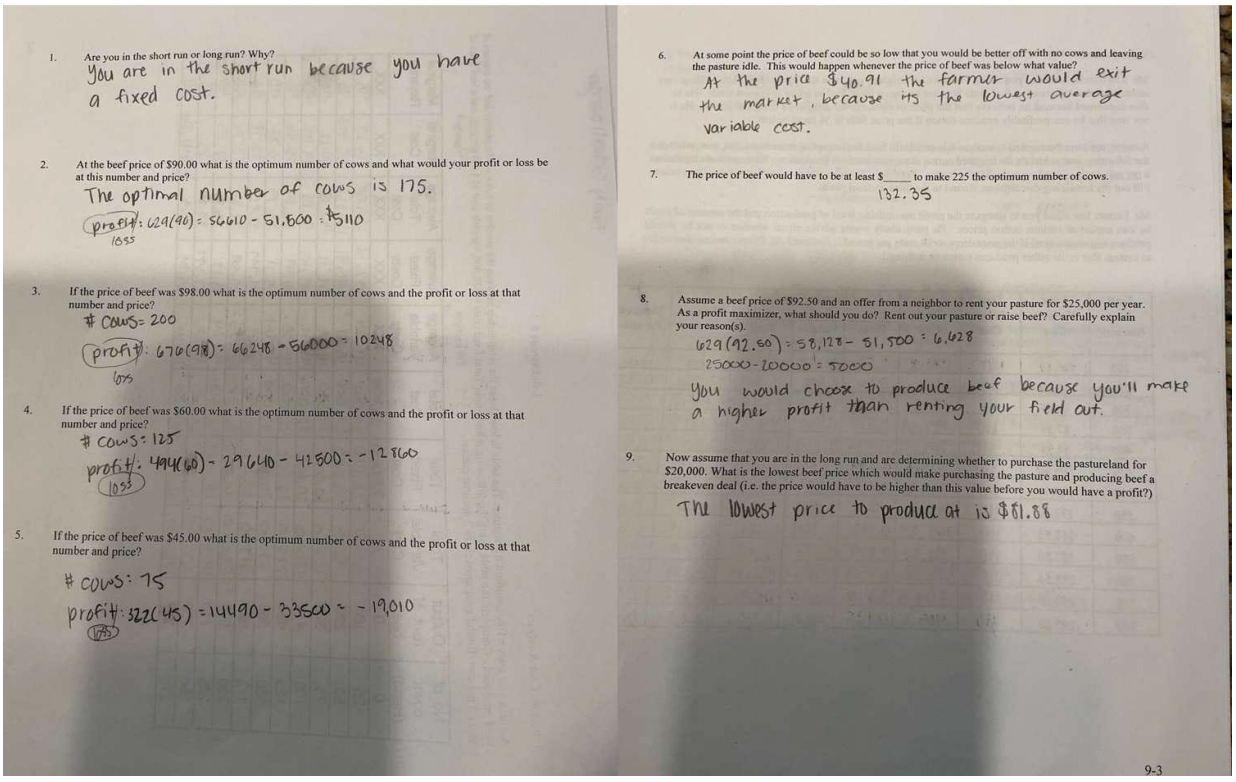
Assume you have been asked to analyze this problem. With the help of an extension agent, you developed the following cost schedule for irrigated cotton at various levels of production. All costs were figured on a per acre basis. Fixed costs are $110 per acre. Total variable costs per acre are listed in the chart below. Fill out the remaining calculations. Round to the third decimal place.

Mr. Farmer has asked you to compute the profit maximizing level of production and the amount of profit he can expect at various cotton prices. He particularly wants advice about whether or not he should produce any cotton at all if the price drops to 58 cents per pound. (Assume I. M. Farmer has no alternative to cotton; that is, he either produces cotton or nothing.)

| Total Prod (lbs/acre) | Total Variable Cost | Total Fixed Cost | Total Cost | Average Cost Per Lb | | | Marginal Cost | Marginal Revenue |
|---|---|---|---|---|---|---|---|---|
| | | | | Fixed | Variable | Total | | |
| 200 | $65.80 | 110 | 175.8 | 0.55 | 0.33 | 0.88 | xxxx | xxxxx |
| 250 | 77.00 | 110 | 187.0 | 0.44 | 0.31 | 0.75 | 0.22 | $0.58 |
| 300 | 80.68 | 110 | 190.68 | 0.37 | 0.27 | 0.64 | 0.07 | $0.58 |
| 350 | 87.59 | 110 | 197.59 | 0.31 | 0.25 | 0.56 | 0.14 | $0.58 |
| 400 | 94.94 | 110 | 204.94 | 0.28 | 0.24 | 0.52 | 0.15 | $0.58 |
| 450 | 103.80 | 110 | 213.80 | 0.24 | 0.23 | 0.47 | 0.18 | $0.58 |
| 500 | 115.30 | 110 | 225.30 | 0.22 | 0.23 | 0.45 | 0.23 | $0.58 |
| 550 | 133.30 | 110 | 243.30 | 0.2 | 0.24 | 0.44 | 0.36 | $0.58 |
| 600 | 155.55 | 110 | 265.55 | 0.18 | 0.26 | 0.44 | 0.45 | $0.58 |
| 650 | 182.80 | 110 | 292.80 | 0.17 | 0.28 | 0.45 | 0.55 | $0.58 |
| 700 | 215.55 | 110 | 325.55 | 0.16 | 0.31 | 0.47 | 0.66 | $0.58 |
| 750 | 254.30 | 110 | 364.30 | 0.15 | 0.34 | 0.49 | 0.78 | $0.58 |
| 800 | 295.80 | 110 | 405.80 | 0.14 | 0.37 | 0.51 | 0.83 | $0.58 |

9-4

**Student 341-33 (score 3)**



1. Are you in the short run or long run? Why?
You are in the short run because you have a fixed cost.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
The optimal number of cows is 175.
profit: 629(90) = 56610 - 51,500 = $5110
loss

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
# cows = 200
profit: 676(98) = 66248 - 56000 = 10248
loss

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
# cows: 125
profit: 494(60) - 29640 - 42500 = -12860
loss

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
# cows: 75
profit: 322(45) = 14490 - 33500 = -19,010
loss

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
At the price $40.91 the farmer would exit the market, because its the lowest average variable cost.

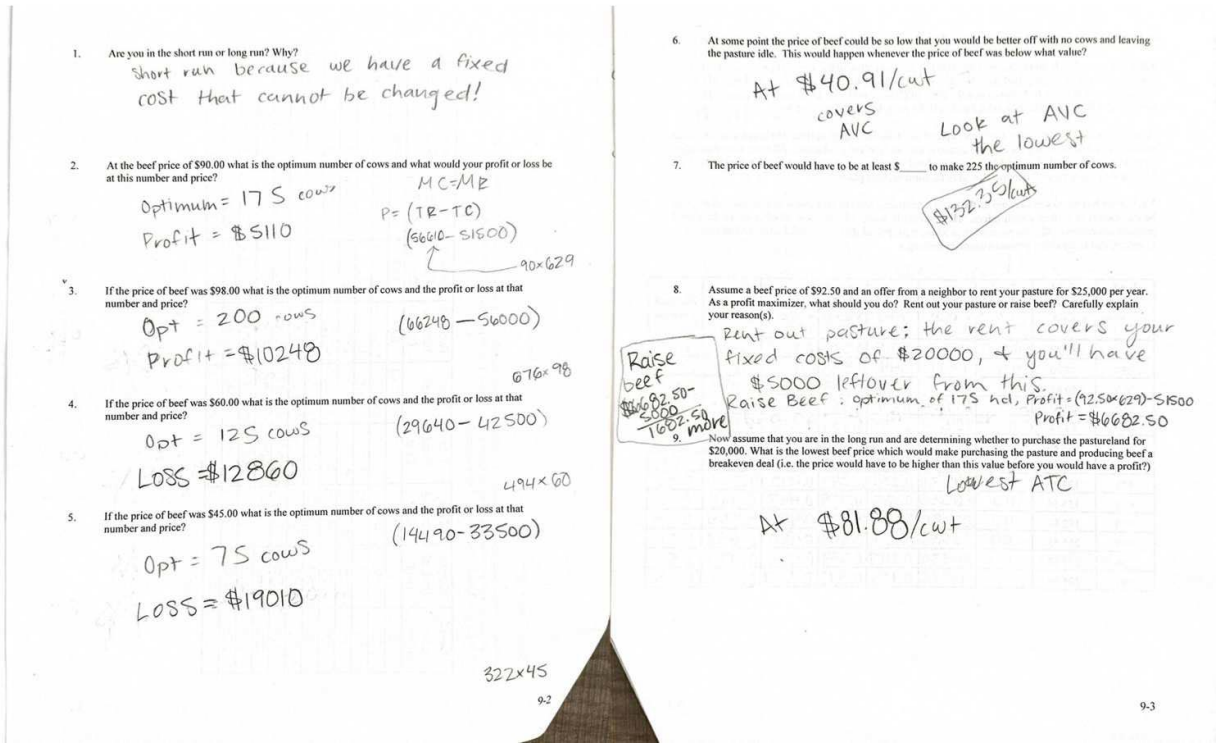
7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
629(92.50) = 58,128 - 51,500 = 6,628
25000 - 20000 = 5000
You would choose to produce beef because you'll make a higher profit than renting your field out.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
The lowest price to produce at is $81.88

9-3

## Student 341-34 (score 3)



1. Are you in the short run or long run? Why?
short run because we have a fixed cost that cannot be changed!

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?
Optimum = 175 cows
Profit = $5110
MC=MR
P=(TR-TC)
(56610 - 51500)
90×629

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
Opt = 200 cows
Profit = $10248
(66248 - 56000)
676×98

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
Opt = 125 cows
LOSS = $12860
(29640 - 42500)
494×60

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
Opt = 75 cows
LOSS = $19010
(14490 - 33500)
322×45

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
At $40.91/cwt
covers AVC
Look at AVC the lowest

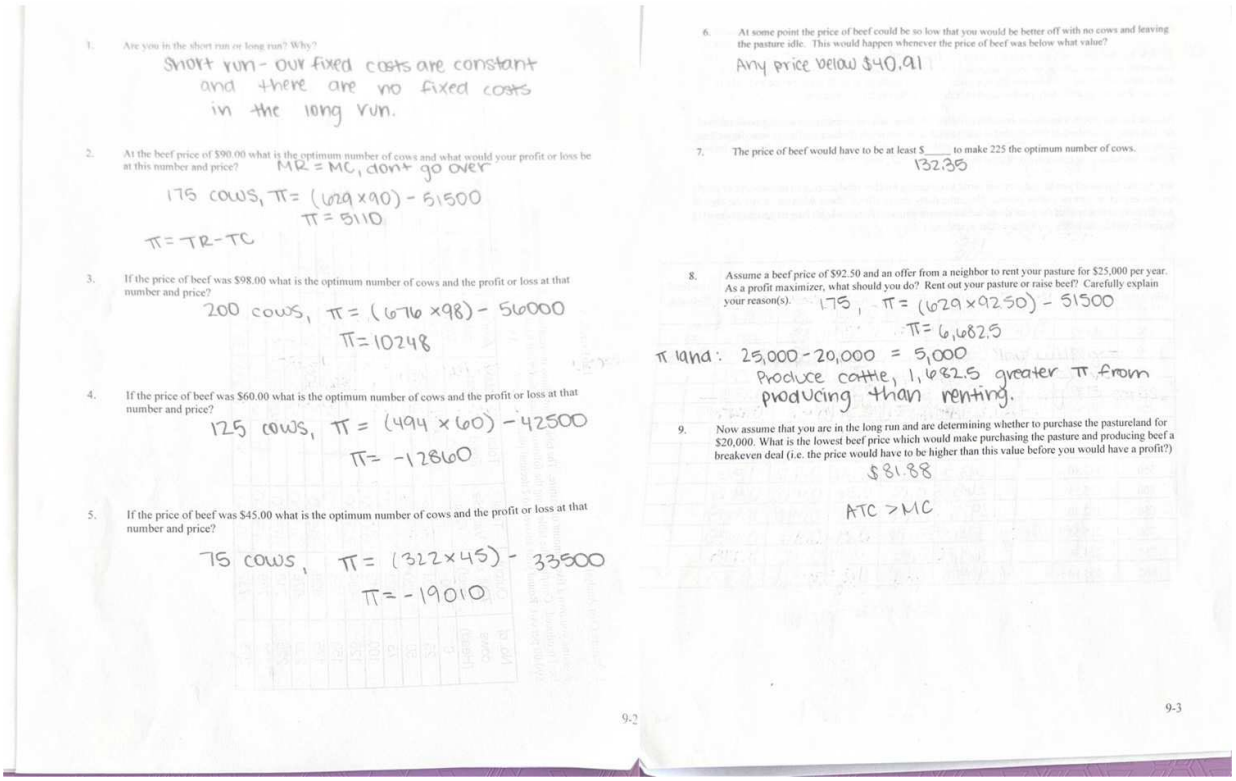
7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
$132.35/cwt

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).
Rent out pasture; the rent covers your fixed costs of $20000, & you'll have $5000 leftover from this.
Raise beef
$66682.50 - 51500 = 15182.50 more
Raise Beef: optimum of 175 hd, Profit = (92.50×629) - 51500
Profit = $66682.50

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
Lowest ATC
At $81.88/cwt

9-3

## Student 341-35 (score 4)



1. Are you in the short run or long run? Why?
Short run - our fixed costs are constant and there are no fixed costs in the long run.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price? MR = MC, don't go over
175 cows, π = (629 x 90) - 51500
π = 5110
π = TR - TC

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?
200 cows, π = (676 x 98) - 56000
π = 10248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?
125 cows, π = (494 x 60) - 42500
π = -12860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?
75 cows, π = (322 x 45) - 33500
π = -19010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?
Any price below $40.91

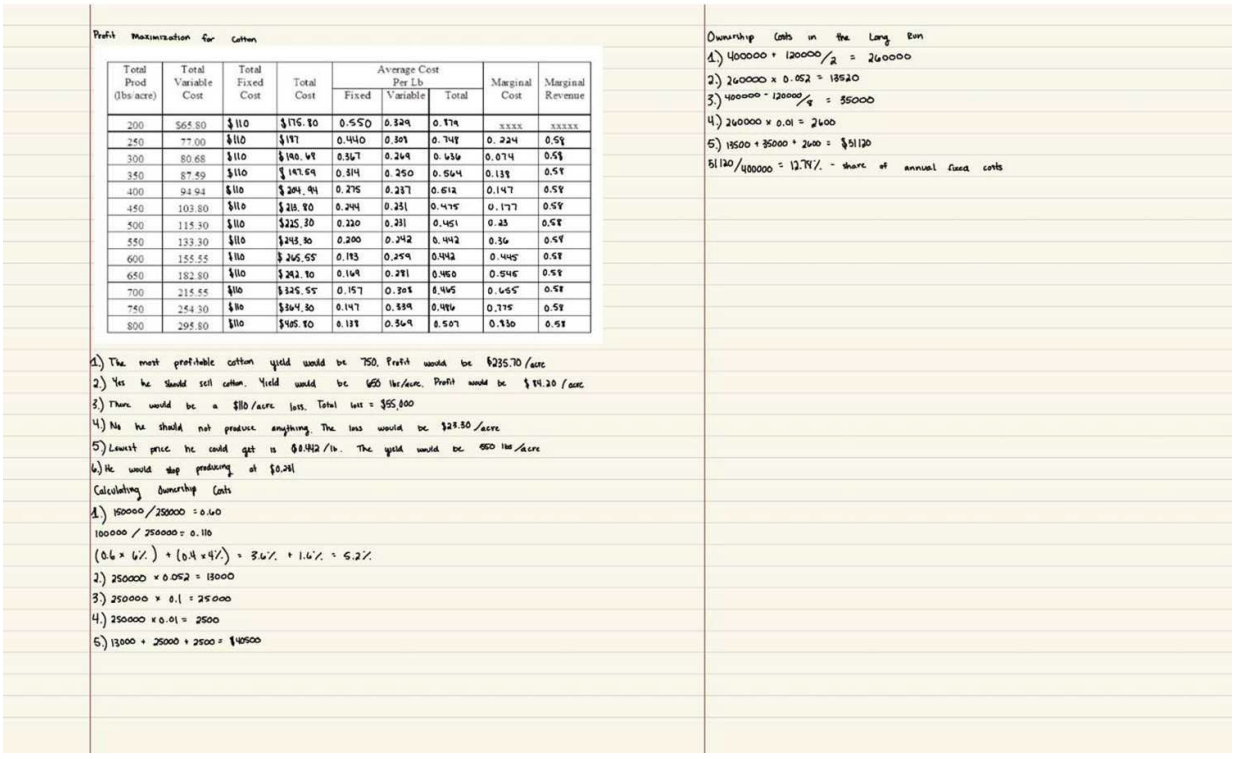
7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.
132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s). 175, π = (629 x 92.50) - 51500
π = 6,682.5
π land: 25,000 - 20,000 = 5,000
Produce cattle, 1,682.5 greater π from producing than renting.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)
$81.88
ATC > MC

9-3

## Student 341-36 (score 3)



Profit Maximization for Cotton

| Total Prod (lbs/acre) | Total Variable Cost | Total Fixed Cost | Total Cost | Average Cost Per Lb | | | Marginal Cost | Marginal Revenue |
|---|---|---|---|---|---|---|---|---|
| | | | | Fixed | Variable | Total | | |
| 200 | $65.80 | $110 | $176.80 | 0.550 | 0.329 | 0.879 | xxxx | xxxx |
| 250 | 77.00 | $110 | $187 | 0.440 | 0.308 | 0.748 | 0.224 | 0.58 |
| 300 | 80.68 | $110 | $190.68 | 0.367 | 0.269 | 0.636 | 0.074 | 0.58 |
| 350 | 87.59 | $110 | $197.59 | 0.314 | 0.250 | 0.564 | 0.138 | 0.58 |
| 400 | 94.94 | $110 | $204.94 | 0.275 | 0.237 | 0.512 | 0.147 | 0.58 |
| 450 | 103.80 | $110 | $213.80 | 0.244 | 0.231 | 0.475 | 0.177 | 0.58 |
| 500 | 115.30 | $110 | $225.30 | 0.220 | 0.231 | 0.451 | 0.23 | 0.58 |
| 550 | 133.30 | $110 | $243.30 | 0.200 | 0.242 | 0.442 | 0.36 | 0.58 |
| 600 | 155.55 | $110 | $265.55 | 0.183 | 0.259 | 0.442 | 0.445 | 0.58 |
| 650 | 182.80 | $110 | $292.80 | 0.169 | 0.281 | 0.450 | 0.546 | 0.58 |
| 700 | 215.55 | $110 | $325.55 | 0.157 | 0.308 | 0.465 | 0.655 | 0.58 |
| 750 | 254.30 | $110 | $364.30 | 0.147 | 0.339 | 0.486 | 0.775 | 0.58 |
| 800 | 295.80 | $110 | $405.80 | 0.138 | 0.369 | 0.507 | 0.830 | 0.58 |

1) The most profitable cotton yield would be 750. Profit would be $235.70 /acre
2) Yes he should sell cotton. Yield would be 650 lbs/acre. Profit would be $89.20 /acre
3) There would be a $110 /acre loss. Total loss = $55,000
4) No he should not produce anything. The loss would be $28.30 /acre
5) Lowest price he could get is $0.442 /lb. The yield would be 650 lbs/acre
6) He would stop producing at $0.281

Calculating Ownership Costs

1.) 150000/250000 = 0.60
100000 / 250000 = 0.40
(0.6 x 6%) + (0.4 x 9%) = 3.6% + 1.6% = 5.2%
2.) 250000 x 0.052 = 13000
3.) 250000 x 0.1 = 25000
4.) 250000 x 0.01 = 2500
5.) 13000 + 25000 + 2500 = $40500

Ownership Costs in the Long Run

1.) 400000 + 120000/2 = 260000
2.) 260000 x 0.052 = 13520
3.) 400000 - 120000/8 = 35000
4.) 260000 x 0.01 = 2600
5.) 13500 + 35000 + 2600 = $51120
51120/400000 = 12.78% - share of annual fixed costs

**Student 341-37 (score 4)**

1. Are you in the short run or long run? Why?

Short run because we have a fixed cost, which is land.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

At 175 beef cows, we make $5,110 profit at this profit making level.

$6,610 - $1,500 = $5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

Profit making number is 200 cows, and profit would be $10,248.

66,248 - 56000 = $10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

Profit making output is 125 cows, and loss is $12,860.

29690 - 42,500 = -12,860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

Profit making output is 75 cows, and loss is $19,00.

$14,490 - 33,500 = -19010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

$40.91, because that's where you're equal to lowest AVC.

7. The price of beef would have to be at least $____ to make 225 the optimum number of cows.

$132.35, bcl thats where MR = MC.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

You will keep producing cows because $6,682.5 is greater than your $5000 profit from land renting.

$58,182.5 - $1,500 = 6,682.5

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

(where ATC > AMC)

$81.88 would be the lowest price because it's where ATC is just above MC, now that ATC is AVC because we're in long run.

9-3

**Student 341-38 (score 3)**

1. Are you in the short run or long run? Why?

Short-run, because there is a fixed variable cost.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price? where MR=MC

so optimum is 175 cows and your profit would be $5,110.00.

Profit: (629×90) - 51,500 = 5110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

200 cows optimum, and a profit of $10,248.00

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

125 cows optimum, and incur a loss of $-(12,860.00).

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

75 cows optimum, and incur a loss of $-(19,010.00).

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

you would want to exit if MR was lower than $40.91 (the lowest AVC) when in short run.

7. The price of beef would have to be at least $132.35 to make 225 the optimum number of cows.

would be at least $132.35 (the marginal cost at 225 cows.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

6,682.50 > 5,000

- you would want to produce beef because you would maximize profit.

| INCOME | |
|---|---|
| rent pasture | produce beef ($92.50) |
| 25000 - 20000 | (176 cows) |
| = $5,000 | (92.5×629) - 51,500 |
| | = $6,682.50 |

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

In the long run, you need to be able to cover your variable cost so if the price falls below $81.88 (lowest ATC) you would no longer want to produce.



## Student 341-39 (score 2)

1. Are you in the short run or long run? Why?

Short run, because the amount of pasture is fixed, so fixed cost = $20,000 and you can only change the number of cows, not the pasture size.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

At a beef price of $90.00, the optimum number of cows is 175.
Output = 629 cwt Total revenue = 90 × 629 = $56,610.00
Total cost = $51,500.00
Profit = $5,110.00

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

At a beef price of $98.00, the optimum number of cows is 200.
Output = 676 cwt Total revenue = 98 × 676 = $66,248.00
Total cost = $56,000.00
Profit = $10,248.00

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

At a beef price of $60.00, the optimum number of cows is 125.
Output = 494 cwt Total revenue = 60 × 494 = $29,640.00
Total cost = $42,500.00
Loss = $12,860.00

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

At a beef price of $45.00, the optimum number of cows is 75.
Output = 322 cwt Total revenue = 45 × 322 = $14,490.00
Total cost = $33,500.00
Loss = $19,010.00



6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

Leave the pasture idle whenever price falls below $40.91 per cwt.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

The price of beef would have to be at least $132.35 per cwt to make 225 cows the optimum number.

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Rent out the pasture. At a beef price of $92.50, the best beef option is 175 cows:
Revenue = 92.50 × 629 = $58,182.50 Cost = $51,500.00 Profit = $6,682.50
Renting gives you $25,000.00, Since $25,000.00 > $6,682.50, renting out the pasture is the profit-maximizing choice.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

In the long run, the lowest beef price needed to break even is $81.88 per cwt.
That is the minimum ATC (average total cost), which occurs at 175 cows. Price must be above $81.88 before you earn a profit.

## Student 341-40 (score 4)

1. Are you in the short run or long run? Why?

Short run, we have fixed costs which do not exist in the long run.

2. At the beef price of $90.00 what is the optimum number of cows and what would your profit or loss be at this number and price?

The optimal stocking rate is 175 head because it is the last level at which MR ≥ MC.

Profit = (90·629) − 51,500 = 5,110

3. If the price of beef was $98.00 what is the optimum number of cows and the profit or loss at that number and price?

The optimal stocking rate at $98/cwt is 200 head.

Profit = (98·676) − 56,000 = 10,248

4. If the price of beef was $60.00 what is the optimum number of cows and the profit or loss at that number and price?

The optimal stocking rate at $60/cwt is 125 head.

Profit = (60·494) − 42,500 = −12860

5. If the price of beef was $45.00 what is the optimum number of cows and the profit or loss at that number and price?

The optimal stocking rate at $45/cwt is 75 head.

Profit = (45·322) − 33,500 = −19010

9-2

6. At some point the price of beef could be so low that you would be better off with no cows and leaving the pasture idle. This would happen whenever the price of beef was below what value?

$40.91, if the price of beef is below this then the farmer can not cover variable costs.

7. The price of beef would have to be at least $_____ to make 225 the optimum number of cows.

$132.35

8. Assume a beef price of $92.50 and an offer from a neighbor to rent your pasture for $25,000 per year. As a profit maximizer, what should you do? Rent out your pasture or raise beef? Carefully explain your reason(s).

Produce: Profit = (92.50·629) − 51,500 = 6,682.50

Rent: Profit = Rent − FC = 5000

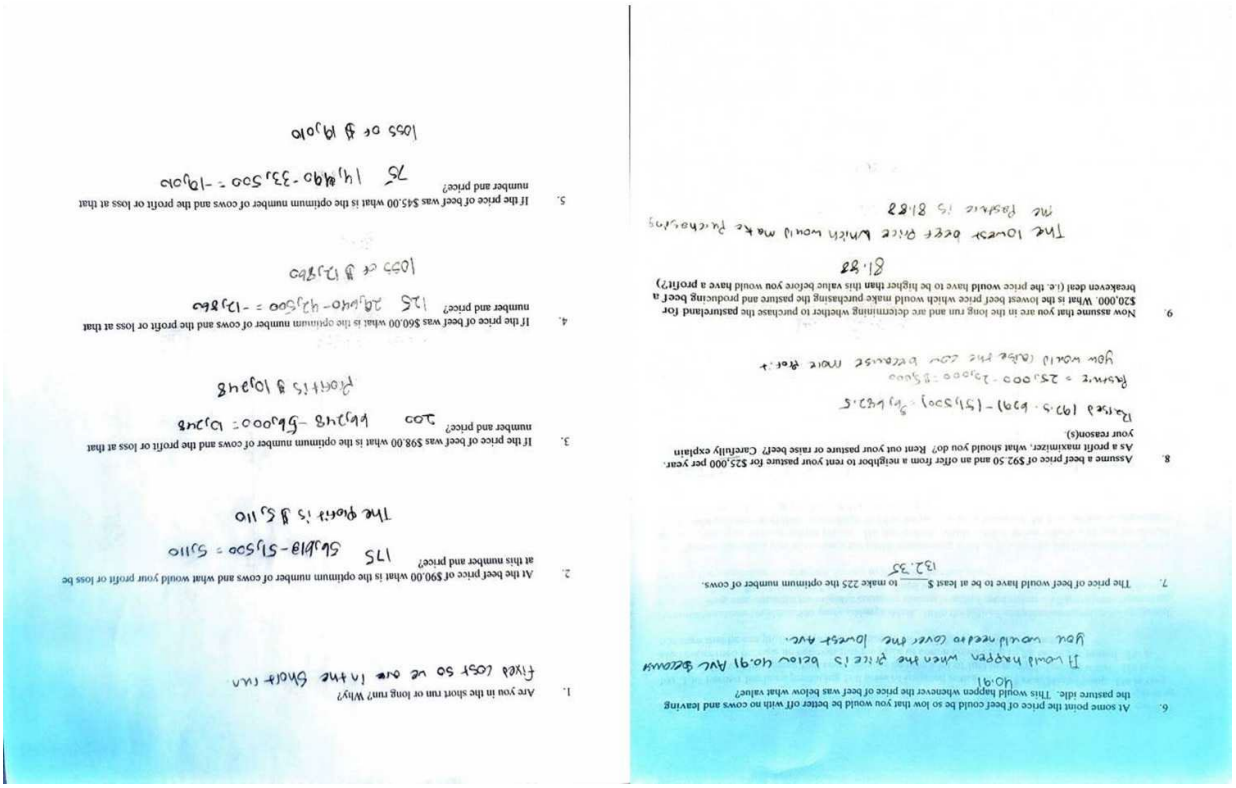
Profit is higher under the scenario where we raise beef - don't rent.

9. Now assume that you are in the long run and are determining whether to purchase the pastureland for $20,000. What is the lowest beef price which would make purchasing the pasture and producing beef a breakeven deal (i.e. the price would have to be higher than this value before you would have a profit?)

$81.88/cwt

9-3

## Student 341-41 (score 3)



## Student 341-42 (score 2)

