



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



Rural supply cooperative Capital budgeting decision case: feasibility study of auxiliary enterprises for a rural supply cooperative

Andrew Marshall, Susan Hine^{*,1}, Norm Dalsted, Donald Lybecker

Department of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO, USA

Abstract

This capital budgeting case evaluates the feasibility of adding an auxiliary enterprise to a feed milling operation that an agricultural supply cooperative is considering purchasing. Both quantitative and qualitative objectives are taken into consideration regarding the cooperative's financial position, community employment, and farm level feasibility. © 2001 Elsevier Science Inc. All rights reserved.

1. Rural supply cooperative

In the fall of 1997, a supply cooperative in western Colorado was approached by a large regional agricultural conglomerate about a lease/purchase decision of the conglomerate's local feed milling operation. The conglomerate intended to close this mill as it was marginally profitable and was interested in divesting its investment due to poor financial performance and limited market outlets. It was hoped that a new enterprise would increase overall profitability by offering more products to the general public without jeopardizing current business. The cooperative's board of directors expressed an interest in purchasing this feed milling facility. Initial negotiations led to a proposed 3-year lease with an option to purchase the feed mill at the end of the lease period. The board of directors also concluded that to make the feed mill investment economically feasible (profitable with early positive cash flows) an auxiliary profitable enterprise activity would be needed.

* Corresponding author.

E-mail addresses: abm@lamar.colostate.edu (A. Marshall), suehine@lamar.colostate.edu (S. Hine), ndalsted@ceres.agsci.colostate.edu (N. Dalsted), deew@lamar.colostate.edu (D. Lybecker).

¹ A teaching note which suggests a case teaching approach is available on request from the authors.

1.1. Problem identification and cooperative objective

The issue to be addressed in this decision case is what possible auxiliary enterprise may best fit into the cooperative's plan of the feed mill purchase. The cooperative assumed that it could operate the feed mill more efficiently by utilizing its own fertilizer enterprise employees and transferring that labor to a feed milling operation during differing (complementary) peak demand seasons. It was also assumed that by adding an additional profitable and complementary enterprise to its operation, the cooperative itself would realize an improved financial position given the large capital investment necessary for the purchase of the feed mill.

The focus of this case is to determine the economic feasibility of one or a combination of processing enterprises considered by the cooperative. Therefore, the objective of this decision case is to provide economic research into necessary levels of capital investment, potential cooperative profits, incremental community employment, and impacts at the farm level due to development of an auxiliary enterprise by the cooperative.

1.2. Background/description of cooperative

This cooperative is an agricultural based supply's cooperative located in a diversified farming community on the western slope of Colorado. The surrounding farming area is a combination of irrigated and dryland farming operations that produces a variety of crops.¹ With nearly 4,100 members, the cooperative is an integral part of the economic base of several rural communities of Colorado. This is a full service cooperative, which includes several retail stores along with a central office. The cooperative deals in an assortment of agricultural inputs including chemical sales and application and seed cleaning.

1.3. Goals of the cooperative for auxiliary enterprises

- Improve cooperative earnings.
- Stimulate local employment and improve tax base.
- Provide a viable alternative crop at the farm level.
- Present a positive impact on the farming community.

The cooperative requires any add-on enterprise be economically feasible. This is measured in differing ways for the multiple goals of the cooperative. Profit at the cooperative level or at the producer level equally benefits its members, while greater profits at the processing level increase employment returns and member dividends. Community goals of increased employment conflict with processing profits, since labor is an input-cost to the production process. To achieve all goals with a single processing operation may not be feasible; therefore, some trade-off may be required to achieve an optimal solution.

1.4. Auxiliary cooperative enterprises

Four possible enterprises are identified as viable processing operations

1. Alfalfa hay processing.

2. Refined wheat flour milling.
3. Oilseed processing.
4. Dry edible bean processing.

1.4.1. Alfalfa hay processing

This enterprise is a new small forage bale compression facility. Product processing develops a superior quality alfalfa hay product that is ideally packaged for shipping to hay export markets. Given hay is the number one produced crop in the region; research into potential new alfalfa hay product processing is called for.

1.4.2. Wheat flour milling

Potential grain/flour milling opportunities are the focus of the second enterprise. This enterprise involves the establishment of a flour milling operation for the production and milling of wheat grains into high quality speciality flours. A similar processing plant was recently established in eastern Colorado during the past year. Growing regional markets include both organic and/or selected premium quality flour markets. Farm level production of both irrigated and dryland wheat is evident in most western Colorado counties as a primary dryland and rotational irrigated crop.

1.4.3. Oilseed processing

Processing high-oleic oilseeds is the focus of the third alternative. This requires the farm level production of food-grade high-oleic oilseeds while utilizing a new fully automated dry extruder/press processing operation to yield both high-oleic oil and high-energy feed meal. Typical high-oleic oilseeds target farm level production of sunflower, safflower or canola oilseed crops. Although, this alternative would involve producing a new crop not traditionally grown in western Colorado, all of the high-oleic oilseed crops mentioned are well suited to the climate of the region.

1.4.4. Dry edible bean processing

The economic feasibility of developing a speciality high quality bean/seed cleaning operation is the fourth enterprise. Potential new markets include certified organic seed cleaning, processing, and marketing of selected dry beans for the U.S. export market. Dry edible beans have been historically grown in western Colorado and this region has a competitive advantage for dry bean production due to favorable climate and growing conditions for legumes.

1.5. Enterprise situation and processing specification

Given the definition of each enterprise's specific processing situation, necessary economic and financial data have been collected to evaluate each alternative for its economic and financial feasibility. Pertinent information for each enterprise specification and expected market conditions are provided in the appendices.

Table 1 in the Appendix offers information regarding acreage of the primary crops in selected western counties in Colorado. These crops and their corresponding acreage indicate

the primary farming practices in the region. Table 2 in the Appendix provides the estimated level of capital investment necessary for each processing situation. These investment levels were based on current estimates from respective industry market conditions. Processing specification and investment levels vary for each alternative according to industry norms and processing-equipment dealer recommendations. Adequate land for each processing facility is owned by the cooperative and was not included in the incremental investment estimate.

Tables 3 to 6 in the Appendix each describe the enterprises' startup profiles, direct processing employment changes, and corresponding acreage requirements for full production processing. (Startup levels vary due to the fact that oilseed processing is a more complicated task than that of repacking alfalfa). A materials balance composition is also provided for each commodity processing. These correspond to typical processing conditions for each commodity as they are transformed from basic agricultural products into final products for the next marketing channel. Three levels of production are delineated to provide a step-wise processing growth for each enterprise. Processing may occur at many levels; these are provided to show possible operation levels and their corresponding employment requirements.

Table 7 in the Appendix provides expected market prices for all enterprise inputs and outputs along with two general price indices. Forecasted prices are based on expected conditions for up to 8 years, with prices based F.O.B. at the cooperative.

Annual operating costs for each enterprise are provided in Table 8 in the Appendix. These are based on full production for each enterprise and assumed to be current for the base period. Specific processing cost differences are generalized to allow for standard cost components among all enterprises. Therefore, these costs are inclusive of all expected operating costs when processing at full capacity as defined for each enterprise. Table 9 in the Appendix includes expected farm level returns growers could expect for the initial set of market prices. These are farm level returns and do not reflect transportation costs from farm to processing facility due to the large geographical differences where crops are grown.

2. Call for action

Given the cooperative's opportunity to purchase a feed milling operation and its board of directors' desire to add a complementary enterprise, the cooperative is interested in recommendations for a new enterprise investment. They are interested in economic research that provides a feasibility analysis of each of the four selected alternatives. All recommendations need to recognize and balance the alternative objectives of the cooperative.

Notes

1. See Table 1 in Appendix for a description of crops grown in the region.

Appendix

Decision case tables are given in Tables 1–9.

Table 1
Historical acreage for selected crops in western Colorado

| Western county | Total hay ^b | Total W.O.B ^a | Total dry beans | Total corn | Total acres | Acres by county (%) |
|-------------------|------------------------|--------------------------|-----------------|------------|-------------|---------------------|
| Delta | 29500 | 1700 | 3500 | 8600 | 43300 | 13 |
| Garfield | 41000 | 2500 | — | — | 43500 | 13 |
| Mesa | 44000 | 4700 | 500 | 10000 | 59200 | 17 |
| Moffat | 25500 | 14100 | — | — | 39600 | 12 |
| Montrose | 41000 | 4600 | 13000 | 11800 | 70400 | 21 |
| Rio Blanco | 29500 | 2200 | — | — | 31700 | 9 |
| Routt | 42500 | 11700 | — | — | 54200 | 16 |
| Total acres | 253000 | 41500 | 17000 | 30400 | 341900 | |
| Acres by crop (%) | 74 | 12 | 5 | 9 | | |

Source: 1998 Colorado Agricultural Statistics.

^a Wheat, oats, and barley.

^b Alfalfa and other hay.

Table 2
New capital investment for processing enterprises

| | |
|---------------------------------|---------|
| Alfalfa hay processing (\$) | 729040 |
| Refined flour milling (\$) | 1983300 |
| Oilseed processing (\$) | 718057 |
| Dry-edible bean processing (\$) | 654800 |

Table 3
Alfalfa hay processing

| | Total units | Three startup levels | | |
|---|-------------|----------------------|-----------|-------|
| | | Startup | Mid-level | Full |
| Capacity (%) | | 42 | 83 | 100 |
| Total operating days (days) | 300 | 125 | 250 | 300 |
| Shifts (# per day) | | 1 | 1 | 1 |
| Hours (hours per day) | | 8 | 8 | 8 |
| Processing rate (tons per hour) | 8.5 | | | |
| Production (tons) | | 8500 | 17000 | 20400 |
| Average yield alfalfa hay (tons per acre) | 5 | | | |
| Acres required (acres) | | 1700 | 3400 | 4080 |
| Materials balance | | | | |
| Hay pressed (%) | 95 | | | |
| Chaff loss (%) | 5 | | | |
| Total new employment (FTE) | | 3 | 4.5 | 5 |

Table 4
Refined flour milling

| | Total units | Three startup levels | | |
|--|-------------|----------------------|-----------|--------|
| | | Startup | Mid-level | Full |
| Capacity (%) | | 33 | 67 | 100 |
| Total operating days (days) | 300 | 300 | 300 | 300 |
| Shifts (# per day) | | 1 | 2 | 3 |
| Hours (hours per day) | | 8 | 16 | 24 |
| Processing rate | 100 | | | |
| Production (cwt) | | 144000 | 288000 | 432000 |
| Average dryland farm wheat yield (Bu/acre) | 30 | | | |
| Acres required (acres) | | 8000 | 16000 | 24000 |
| Materials balance | | | | |
| Flour processed (%) | 73 | | | |
| Bran/mill run (%) | 27 | | | |
| Total new employment (FTE) | | 3 | 4 | 5 |

Table 5
Oilseed processing

| | Total units | Three startup levels | | |
|---------------------------------------|-------------|----------------------|-----------|-------|
| | | Startup | Mid-level | Full |
| Capacity (%) | | 33 | 67 | 100 |
| Total operating days (days) | 300 | 300 | 300 | 300 |
| Shifts (# per day) | | 1 | 2 | 3 |
| Hours (hours per day) | | 8 | 16 | 24 |
| Processing rate (tons per hour) | 1 | | | |
| Production (tons) | | 2400 | 4800 | 7200 |
| Average farm oilseed yield (cwt/acre) | 12.8 | | | |
| Acres required (acres) | | 3750 | 7500 | 11250 |
| Materials balance | | | | |
| Oil capture (%) | 35 | | | |
| Meal capture (%) | 58 | | | |
| Water loss (%) | 7 | | | |
| Total new employment (FTE) | | 3.5 | 5.5 | 7 |

Table 6
Dry edible bean processing

| | Total units | Three startup levels | | |
|--------------------------------|-------------|----------------------|-----------|------|
| | | Startup | Mid-level | Full |
| Capacity (%) | | 33 | 67 | 100 |
| Total operating days (days) | 225 | 75 | 150 | 225 |
| Shifts (# per day) | | 1 | 1 | 1 |
| Hours (hours per day) | | 8 | 8 | 8 |
| Processing rate (cwt per hour) | 60 | | | |

Table 6 (Continued)

| | Total units | Three startup levels | | |
|---------------------------------------|-------------|----------------------|-----------|------|
| | | Startup | Mid-level | Full |
| Production (cwt) | 36000 | 72000 | 108000 | |
| Average farm oilseed yield (cwt/acre) | 18 | | | |
| Acres required (acres) | | 2000 | 4000 | 6000 |
| Materials balance | | | | |
| Beans processed (%) | 97 | | | |
| Culls/splits (%) | 3 | | | |
| Total new employment (FTE) | | 3 | 5 | 7 |

Table 7
Expected market prices

| | Time period forecast | | | | | | | |
|---|----------------------|--------|--------|--------|--------|--------|--------|--------|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
| CPI total (%) | 100 | 102.4 | 104.8 | 107.2 | 109.6 | 112.0 | 114.4 | 116.9 |
| PPI total (%) | 100 | 101.8 | 103.7 | 105.8 | 107.6 | 109.4 | 111.2 | 113.1 |
| Price alfalfa hay (\$/t) ^a | 100.00 | 97.27 | 96.03 | 95.92 | 97.34 | 99.36 | 101.29 | 102.94 |
| Net compressed hay (\$/t) ^a | 126.73 | 120.89 | 117.68 | 116.41 | 118.00 | 120.71 | 123.20 | 125.16 |
| Price of wheat (\$/cwt) | 6.20 | 6.55 | 6.76 | 6.91 | 7.17 | 7.33 | 7.54 | 7.58 |
| Price of refined flour (\$/cwt) | 11.00 | 11.40 | 11.69 | 11.91 | 12.24 | 12.58 | 12.92 | 13.25 |
| Price of millrun/bran (\$/cwt) | 3.01 | 3.06 | 3.18 | 3.36 | 3.62 | 3.96 | 4.40 | 4.97 |
| Price oilseed (\$/cwt) | 12.50 | 12.52 | 12.61 | 12.68 | 12.79 | 12.94 | 13.05 | 13.24 |
| Price oil (\$/lb) | 0.35 | 0.3488 | 0.348 | 0.348 | 0.349 | 0.351 | 0.353 | 0.359 |
| Price meal (\$/t) | 140.00 | 141.75 | 143.55 | 144.64 | 146.46 | 148.96 | 150.59 | 152.40 |
| Price dry beans (\$/cwt) ^b | 16.00 | 16.02 | 16.14 | 16.23 | 16.37 | 16.56 | 16.71 | 16.95 |
| Price F.O.B. fruits (\$/cwt) ^b | 21.00 | 21.03 | 21.18 | 21.30 | 21.49 | 21.74 | 21.93 | 22.25 |

Source: 1999 FAPRI U.S. Agricultural Outlook—Briefing Book. 1998 California Alfalfa Hay Price Summary, USDA AMS. Various USDA AMS Market New Reports. USDA Baseline Projections, February 1999.

^a Price F.O.B. fruits.

^b Sacked and cleaned.

Table 8
Annual operating costs under full production for each enterprise

| | Alfalfa | Flour | Oilseed | Dry beans |
|--------------------------|---------------------------|---------|----------|-----------|
| Estimated fixed cost | | | | |
| Depreciation | 12.5% of investment | \$91130 | \$247913 | \$89757 |
| Interest on investment | 8% of investment | 58323 | 158664 | 57445 |
| Salary administrative | 1 manager | 41300 | 41300 | 41300 |
| Property taxes | 0.088 × 0.29 × investment | 18605 | 50614 | 18325 |
| Insurance | 0.2% of investment | 1458 | 3967 | 1436 |
| Building and maintenance | 2% of investment | 14581 | 39666 | 7766 |
| Energy-demand charge | #hp × \$12.55 per month | 28087 | 16852 | 22470 |
| Total fixed costs (\$) | 253484 | 558975 | 238498 | 217885 |

Table 8 (Continued)

| | | Alfalfa | Flour | Oilseed | Dry beans |
|------------------------------------|-----------------------|---------|--------|---------|-----------|
| Estimated variable operating costs | | | | | |
| Labor (\$) | 12.00 per hour | 99840 | 99840 | 149760 | 149760 |
| Benefits | 18% of labor costs | 17971 | 17971 | 26957 | 26957 |
| Energy | \$0.0165/kWh | 7363 | 13253 | 17820 | 2209 |
| Repairs/maintenance | \$0.1/cwt | 40800 | 43200 | 15000 | 10800 |
| Lab material | \$0.05/cwt | | 64800 | 7500 | 16200 |
| Miscellaneous | 10% of variable costs | 16597 | 17426 | 21704 | 18973 |
| Total variable costs (\$) | 182572 | 256491 | 238740 | 224898 | |
| Total annual operating costs (\$) | 436056 | 815466 | 477239 | 442783 | |

Table 9
1998 Farm level crop production budgets

| Estimated net receipts at farm level | Per acre (\$) |
|--------------------------------------|---------------|
| Irrigated alfalfa hay | 3794 |
| Dryland winter wheat | 1197 |
| Dryland sunflowers for oil | 2317 |
| Dry-edible pinto beans | 3437 |