Analysis Of Sales Problems Of Small Value-Added Agricultural Processors

Steven J. Torok, Dale J. Menkhaus, Vincent Colombel, and Edward B. Bradley
University of Wyoming

The US value-added agricultural processing industry, which includes all food processors involved in changing raw agricultural products to processed food products, is "big business." In 1987, the US food processing industry contributed about $85 billion in value to the food supply and shipped nearly $330 billion in processed food products (Gallo et al.). Furthermore, the US leads the world in processed food production.

In employment, food processing employed about 1.6 million people in the US in 1985 (Chinkook et al.). Moreover, the higher the level of processing associated with an agricultural commodity, the greater the number of jobs generated. As reported by Otto and Williams (p.2), "Many agricultural based states have become increasingly interested in developing and exploiting value-added industries in agriculture as a means of fostering economic development."

The bulk of value-added agricultural processors in the US fit in the category of small business as defined by the Small Business Administration.[1] For example, food and kindred products processors that employed less than 500 employees in 1982 accounted for 98 percent of all establishments in the industry (Bureau of the Census 1985). Furthermore, in 1982 every state in the US had a majority of food and kindred processors that employed 500 or less employees (Bureau of the Census 1986). Thus, small value-added agricultural processors are an integral element in the US agribusiness complex.

There probably exists a number of problems and barriers that are causing difficulty, or preventing expansion, by small value-added agricultural processors. However, the analysis of sales problems is one of the more important issues that needs attention by management. We can advance several arguments to justify an analysis of sales problems as opposed to other business problem areas.

First, many studies have reported the importance of sales problems in small businesses. For example, Dun and Bradstreet reported that inadequate sales caused 10.4 percent of the failures of small manufacturing firms in 1987. Vosikis and Glueck also reported that the problem of inadequate sales has been one of the major causes of business failures. Stephenson further reported that sales were especially important for fledgling firms. Broom and Longenecker concluded that declining sales were one of the symptoms of business failure. In a review of 688 Small Business Institute cases, Kennedy, Loutzenhiser, and Chaney found inadequate sales occurred in 49 percent of the firms with gross sales of $100,000 or less. For firms with gross sales larger than $100,000, the rate was 14.6 percent. These researchers confirm that sales problems often occur in small businesses and cause business failures. Alternatively, research has identified the importance of sales for firms to be successful (Bureau of Business and Economic Research; Apostolidis; Peterson and Lill; and Saladin and Nelson).

Second, sales volume is an important marketing factor for determining profit (Udell; Bergfeld; and Hofer and Sandberg). Hence, we can link a reduction of profits to sales problems.

Third, a better understanding of sales problems of small agricultural value-added processors could aid various institutions as well as individuals. Government agencies would be able to more effectively aim their policies to help firms in increasing their sales. These agencies could also identify the probable effect of regulations on sales by these firms. Finally, entrepreneurs could adjust marketing and management practices to enhance their ability to increase sales.

The objectives of this paper are to analyze survey data to identify technical or educational assistance needs that may help small value-added agricultural processors in increasing their sales. We will also examine policy alternatives suggested by the data and management strategies that may aid firms in increasing their sales.

Survey Procedure

In 1986, the State of Wyoming funded a survey research project to help value-added agricultural processors in Wyoming. We designed a questionnaire to investigate various problems of these businesses. In addition, we collected demographic and business characteristic data.

The Wyoming value-added agricultural processors surveyed included only those businesses which add value to raw agricultural products. Another selection criterion was that the processing performed be in Wyoming. After we completed the population selection process, we interviewed a total of 115 firms. These represented most of the value-added agricultural

processors existing in Wyoming in 1987. According to the Small Business Administration's definition of a small business, all the value-added agricultural processors interviewed were small—all had fewer than 500 employees.

Most of the survey questions were binary or multi-choice. The remainder of the questions were continuous or open-ended. Although we administered the questionnaire to Wyoming small value-added agricultural processors, the results and analysis should have broad implications because most of the food and kindred products processors in every state in the US employ less than 500 people.

Analysis of the Difficulty of Increasing Domestic Sales

The questionnaire asked management to report the effects they experienced due to the difficulty of increasing domestic sales. Thirty-two percent of the respondents reported that this difficulty with increasing domestic sales caused a "considerable problem," 2 percent reported that it would "likely put me out of business," 34 percent reported that it caused a "minor problem," 30 percent reported that it caused "no problem," and 2 percent did not answer or did not know.

We performed a Chi-square test[2] on over 260 survey questions[3] to determine whether a relationship existed between the difficulty of increasing domestic sales and variables representing technical or educational assistance needs, policy alternatives, and firm characteristics. We identified significant variables using two criteria. First, each variable had to be significant at the $\alpha = .01$ probability level. Second, all variables had to have a minimum number of observations in each cell to make the Chi-square statistic a valid test. A significant Chi-square statistic says that a relationship exists between the difficulty of increasing domestic sales and various factors representing technical or educational assistance needs, policy alternatives, and firm characteristics. The test however, provides no information on causality.

Chi-Square Results

Table 1 provides the Chi-square results on the "difficulty with increasing domestic sales." Twenty variables were significant at the $\alpha = .01$ probability level.[4] To ease discussion, we grouped these 20 significant variables into three categories representing technical or educational assistance needs (variables 1-6), policy alternatives (variables 7-15), and management strategies (variables 16-20).

Variables 1 through 6 represent technical or educational assistance needs perceived by management that may aid firms in increasing their domestic sales. These technical or education needs include help in the areas of pre-

Table 1.
Chi-Square Results of the "Difficulty of Increasing Domestic Sales"

Variables	Chi-Square Statistic	Probability Level
1. Difficulty in Pricing Your Products	18.321	0.000
2. Difficulty in Developing an Advertising Strategy	10.114	0.001
3. Difficulty in Developing New or Improved Products	6.777	0.009
4. Difficulty in Preparing an Overall Marketing Plan	6.953	0.008
5. High Costs of Advertising	6.825	0.009
6. Difficulty in Getting Information/Help on Sales and Merchandising	6.777	0.009
7. Difficulties Associated with the National Economy	11.743	0.001
8. Questionable Availability or Cost of Employees Due to the "Boom/Bust" Nature of the Wyoming Economy	8.982	0.003
9. Regulations Governing Construction	8.911	0.003
10. Regulations Governing Operations	14.713	0.000
11. Product Safety and Labeling Regulations	10.724	0.001
12. Property Taxes Are Too Costly	14.847	0.000
13. Property Insurance is Too Costly	30.041	0.000
14. Liability Insurance is Too Costly	13.970	0.000
15. Automobile Insurance is Too Costly	17.986	0.000
16. The Competition is Crowding This Business Out of Existing Markets	9.376	0.002
17. No Local Suppliers for New Technology	6.825	0.009
18. Difficulty in Paying Bills on Time	13.974	0.000
19. Difficulty in Collecting Money People Owe the Business	8.292	0.004
20. Difficulty in Getting Information/Help on Financial Analysis	6.777	0.009

paring a marketing plan, pricing, and advertising, as well as areas of new or improved product development, and salesmanship and merchandising. Obviously, many technical or educational service organizations provide programs in the area of sales enhancement. However, the Chi-square results suggest that these five needs should be the primary focus of programs that address strategies and methods to increase domestic sales.

Variables 7 through 15 represent possible policy alternatives to reduce firms' difficulty with increasing domestic sales. Variables 7 and 8 relate to the national and state economic climate. The respondents implied that national policymakers should be more aware of the effect that macroeconomic policy has on small value-added agricultural processors. They also suggested that state governments should make every effort to diversify their economy to avoid boom and bust cycles.

Variables 9 through 11 suggest that government regulations affect the ability of firms to increase domestic sales. For example, regulations governing construction, operations, product safety, and labeling may adversely affect production costs of small firms through changes in plant and equip-

ment, research and development expenditures, and packaging compliance. Second, regulations governing product safety and labeling could restrict processors in developing new products or entering new markets.

Variable 12 reflects the burden placed on the surveyed businesses by property taxes. Variables 13 through 15 relate to the various insurance costs borne by the surveyed firms.

Variable 16 shows that the surveyed businesses have difficulty with increasing their domestic sales because they are not competitive on price, quality, location, or selection. Variable 17 reflects the difficulty that the surveyed firms have in securing local access to new technology. Variables 18 through 20 highlight the financial characteristics of the surveyed businesses. It should not be surprising that firms with sales difficulty are also experiencing financial difficulty.

The surveyed firms perceived their difficulty with increasing domestic sales as a result of exogenous variables. However, survey data reported by the National Federation of Independent Businesses, Winter and Scott, and Edmunds suggest that competition and government intervention were major problems for small businesses.

Implications to Technical/Educational Assistance Organizations, Policymakers, and Management

We ranked the 20 variables which were significant in the Chi-square analysis to determine the relative importance of each variable. Table 2 provides a rank-order prominence of these 20 significant variables. We will focus only on the top ten significant variables in Table 2.

Technical and Educational Organizations. The technical and educational assistance area of advertising should receive the highest priority. Advertising issues ranked fifth and twelfth in Table 2. Other marketing issues (14 and 18-20 in Table 2) ranked lower than advertising.

The provision of technical or educational aid in the area of advertising is consistent with the community economic development strategy outlined by Pulver. Specifically, Pulver suggests that communities should organize assistance programs to foster management capacities to improve the efficiency of existing firms. Extension can play a role in providing help in the area of advertising because it is consistent with the CES's program of "Revitalizing Rural America" (Byrne).

Policymakers. The top four variables ranked in Table 2 are policy alternatives related to insurance (liability, property, and automobile) and the national economic climate. Policy related to liability, property, and automobile insurance should focus on developing alternative risk management strategies. We should consider the pooling of insurance risks at the state

Table 2.
Rank-Order Prominence of the Significant Variables in the Chi-square Analysis

Rank	Variable	Mean	Response	Score*
1.	Liability Insurance is Too Costly	2.37	110	178.97
2.	Property Insurance is Too Costly	2.65	107	144.99
3.	Difficulties Associated with the National Economy	2.81	111	132.00
4.	Automobile Insurance is Too Costly	2.79	108	131.00
5.	High Costs of Advertising	2.74	103	130.00
6.	Difficulty in Collecting Money People Owe the Business	2.93	115	123.00
7.	Regulations Governing Operations	3.02	115	113.05
8.	No Local Suppliers for New Technology	2.97	106	109.01
9.	Questionable Availability or Cost of Employees Due to the "Boom/Bust" Nature of the Wyoming Economy	3.10	112	101.02
10.	The Competition is Crowding This Business Out of Existing Markets	3.17	114	95.10
11.	Property Taxes are Too Costly	3.10	105	95.03
12.	Difficulty in Developing an Advertising Strategy	3.10	105	95.00
13.	Regulations Governing Construction	3.17	112	93.00
14.	Difficulty in Preparing an Overall Marketing Plan	3.16	106	89.00
15.	Product Safety and Labeling Regulations	3.31	113	78.00
16.	Difficulty in Paying Bills on Time	3.41	115	68.00
17.	Difficulty in Getting Information/Help on Financial Analysis	3.42	112	65.00
18.	Difficulty in Developing New or Improved Products	3.39	101	62.00
19.	Difficulty in Getting Information/Help on Sales and Merchandising	3.46	112	61.00
20.	Difficulty in Pricing Your Products	3.50	113	56.00

* Rank Ordering Score = $(4 - \bar{x})N$; where: 4 = maximum of rating scale
$\bar{x}$ = mean value of rating
N = number responding

or national level. However, insurance subsidies are another possibility, but are more revenue intensive. Regarding the national economic climate, one way to educate national policymakers is to focus attention on the benefits from retention and expansion of existing businesses.

Other policy alternatives in the top ten in Table 2 include regulations governing operations and costs due to boom and bust cycles. The "availability or cost of employees due to boom/bust cycles" is particularly a problem for single or few industry states and communities. Obviously, many state and local policymakers are aware of this issue and make efforts to diversify their economies. However, we should tailor job training programs to reduce labor problems caused by boom and bust cycles.

Management. Table 2 reports three areas ranked in the top ten which need attention by management: collecting money owed to the business (ranked 6), a lack of suppliers of new technology (ranked 8), and competition (ranked 10). Collecting money owed to the business implies that

the surveyed businesses are having troubles collecting accounts receivables from sales of the firm's products. Many firms offer credit to their customers as a means of enhancing sales. However, there are many factors which add to difficulties with collecting accounts receivables. These include the presence of many delinquent accounts, too liberal credit terms, inadequate credit checks, and no follow-up on slow accounts (Bernstein; Garrison).

There are several management strategies to improve the collection of accounts receivables. First, management could adopt a credit record-keeping system that would provide timely information on past-due accounts. Second, managers could reconsider their credit policy. However, reducing credit terms could have an adverse affect on sales. Third, adoption of a credit-checking system would identify poor credit risks. Fourth, an aggressive follow-up policy on slow accounts could include the use of collection agencies.

We must note the relation to "difficulties with collecting money owed to the business" and to problems with "paying bills on time" (ranked 16). For example, firms that do not receive money owed to the business will suffer cash-flow problems or difficulties with paying bills on time.

The problem of "lack of suppliers of new technology" is quite different from "difficulties with collecting money owed to the business." The lack of suppliers of new technology reduces the adoption of technology. Further, the lack of adoption of technology increases the firm's relative production costs (Shaffer). This in turn will have an impact on sales through higher product prices.

Finally several factors can make the firms' products less competitive. These include price, quality, location, and selection. Small value-added agricultural processors need to examine their comprehensive marketing strategies. Aid organizations should provide programming to develop an overall marketing plan for small value-added agricultural processors.

Conclusions

The conclusions from this survey include:

1. The highest priority for aid to small value-added agricultural processors is in advertising.
2. We should examine policy alternatives including insurance pooling schemes, insurance subsidies, national macroeconomic policy, avoidance of inconsistent or arbitrary regulations, enhancement of cooperation and communication between regulatory agencies and businesses, efforts by state governments to diversify their economy, tailoring of job aid programs to reduce labor problems caused by

boom and bust cycles, and involvement by communities in providing local access to new technology to businesses.

3. Managers need to consider adopting a timely credit record-keeping system, adjusting credit terms, adopting a credit-checking system, providing aggressive follow-up to delinquent credit accounts, searching for alternative access to new technology, collectively encouraging vendors to provide sources of new technology, and preparing an overall marketing plan.

Notes

1. The range of the maximum number of employees that satisfies the SBA's definition of a small business is from 500 to 1,000 employees depending on the value-added agricultural processing sub-industry. However, most sub-industries in the value-added agricultural processing industry are in the 500 maximum number of employees class.
2. Here, we used the Chi-square statistic to test the hypothesis (H_0) that "difficulty in increasing domestic sales" is independent of the various response variables.
3. Most of the 260 survey questions were multi-choice and asked each respondent to tell the extent a particular item was a problem for their business. The responses possible were "likely to put me out of business," "considerable problem," "minor problem," or "no problem." We defined these questions (including "difficulty with increasing domestic sales") as a two-category discrete variable. We grouped "likely to put me out of business" and "considerable problem" in one class and "minor problem" and "no problem" in the other class. This grouping was necessary because with the use of four classes, there were not enough observations in many of the cells to get a reliable Chi-square statistic.
4. The questionnaire used in the study is available from the senior author upon request.

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