

Cash Versus Contract Marketing in the U.S. Lamb Industry¹

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Summary

Lamb operations in the United States are experiencing unfavorable market conditions, such as declining breeding inventories, stagnant domestic lamb consumption, and increasing competition from imported lamb. To more effectively compete, some operations may turn to nontraditional marketing arrangements, such as use of contracts, to purchase and sell lambs. To determine the extent of alternative marketing arrangements (AMAs) use in the U.S. lamb industry, we conducted a nationally representative mail survey of lamb producers and feeders. We received 302 completed surveys (53 percent weighted response rate). The survey collected information on purchases, sales and pricing methods, reasons why operations

use their choice of marketing arrangements, and operation characteristics. We compared small and large operations, as well as Eastern and Western U.S. operations. Primarily U.S. lamb operations use cash-marketing methods to purchase and sell lambs. However, there appears to be a slight trend away from auction markets toward other types of cash-market transactions, such as direct trade. Large operations are more likely to use AMAs than small operations. Likewise, Western U.S. operations are more likely than Eastern operations to use AMAs. Large operations use AMAs to reduce risk, while small operations use AMAs to sell their lambs at higher prices.

Key Words: Alternative Marketing Arrangements, Contract, Lambs, Sales

Introduction

The U.S. lamb industry faces many challenges, including decreasing inventories of breeding sheep, stagnant domestic lamb consumption levels, and increasing competition from imported lamb (USDA/National Agricultural Statistics Service (NASS), various years; USDA/Economic Research Service (ERS), 2006). From 1970 through 2004, breeding sheep and ewe inventories declined from 31 million sheep to 8 million sheep. Between 1990 and 2004, annual domestic lamb consumption fell from 1.4 pounds to 1.1 pounds per person (USDA/ERS, 2006), while lamb imports increased from 40.7 million pounds to 180.9 million pounds.

To overcome these challenges, the industry will have to adapt to changing market conditions. One such adaptation might be in the use of nontraditional marketing arrangements to purchase and sell lambs. Muth et al. (2005) suggested that contracts offer advantages to both lamb producers and packers by offering incentives for higher-quality meat. Williams and Davis (1998) further contend that contracts allow packers to operate near capacity and help stabilize inventories.

Types of Marketing Arrangements Used in the Lamb Industry

Lamb producers (or lambing operations) have three options for marketing lambs—selling feeder lambs to feedlots, retaining ownership through contract feeding, or feeding feeder lambs and selling the fed lambs directly to packers for slaughter (Bastian and Whipple, 1998). Lamb feeders, in turn, purchase lambs from lamb producers and sell fed lambs to packers.

Marketing arrangements are the methods by which lambs are transferred through successive stages of production and marketing. There are two categories of marketing arrangements: cash (or spot) and alternative. In this paper, cash- or spot-market transactions refer to transactions that occur immediately or “on the spot.” These include auction barn sales; video or electronic-auction sales; sales through order buyers, dealers, and brokers; and direct trade. The terms “cash market” and “spot market” are used interchangeably, and might also be referred to

as “traditional” marketing. Alternative-marketing arrangements (AMAs) are all possible alternatives to the cash or spot market. In the lamb industry, these include arrangements such as forward contracts, marketing agreements, packer owned, custom feeding, and custom slaughter. Forward contracts and marketing agreements generally use some type of formal contracts for the agreement and are the most commonly used AMAs for purchasing and selling lambs. As described by Brester et al. (2007), the types of AMAs are as follows:

- **Forward contract:** Oral or written agreement between a buyer (packer) and seller for future purchase of a specified quantity of lambs at either a fixed or base price more than two weeks before delivery or kill date.
- **Marketing agreement:** An ongoing, long-term oral or written agreement between a buyer and seller, where the buyer agrees to purchase lambs under specific terms.
- **Packer owned:** Lambs are owned by the packer and fed for slaughter at either a custom feedlot or a packer-owned or packer-controlled feedlot (or company-owned farms).
- **Custom feeding:** Providing feeding services for a fee (lambs are owned by producer or by a packer).
- **Custom slaughter:** Providing slaughter services for a fee (lambs are owned by producer or feeder).

The key dimensions of marketing arrangements include the ownership method for lambs (i.e., sole ownership, shared ownership, or owned by another entity) and the type of pricing and valuation methods. The pricing method provides additional information about transactions by specifying how the price was determined (e.g., individual negotiations or formula pricing). If formula pricing is used, a base price used in the formula must be specified. In the case of packer ownership or other types of transfers within a company, an internal transfer pricing method is used. The valuation method further defines the transaction type by indicating how the price was applied (per head, per-pound live weight, or per-pound carcass weight). Carcass-weight valuation might be based on a grid that offers premiums or discounts based on weight range and carcass quality grade.

Purpose

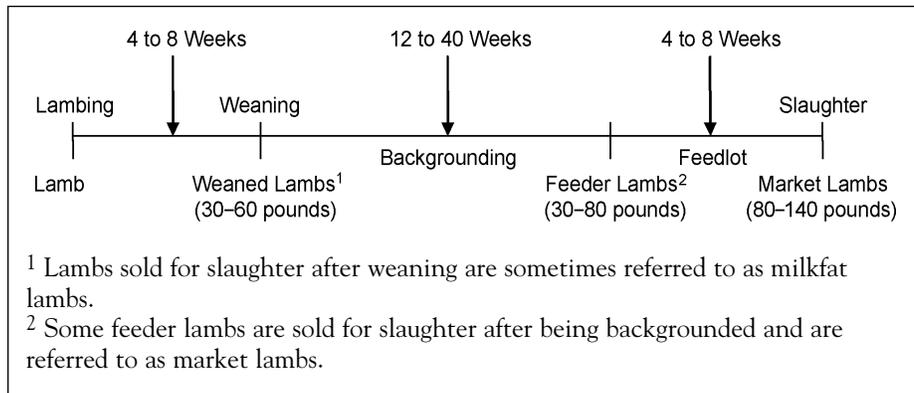
The purpose of this study was to compare use of cash-marketing methods with AMAs in the lamb industry. In this paper, we describe methods used by lamb operations in the United States to sell market-fed lambs through both traditional (i.e., cash) and alternative (i.e., contract) marketing arrangements. We also describe the reasons why operations use their choice of marketing arrangements. Finally, we discuss implications of using AMAs in the lamb industry.

Although AMAs can be used at any stage of the marketing chain, we focus our analysis on the feeder lamb production and feeding stage. To provide a better understanding of how lambs are marketed, we first provide a brief summary of lamb production.

U.S. Lamb Industry Background

The specific stages of slaughter lamb production in the United States include feeder-lamb production, backgrounding, feeding, packing, and processing or breaking (i.e., cutting carcasses into primal, subprimal, and other meat cuts). In some cases, all of these stages are distinct production stages. However, production, backgrounding, and feeding are often combined at the livestock-production stage, and packing and breaking are often combined at the meat-production stage. Most sheep can only be bred during specific times of the year, so the majority of lambs are born in the spring. Newborn lambs will remain with ewes for four to eight weeks before they are weaned (Figure 1). After weaning, lambs can be sent directly to a feedlot, or they may be backgrounded to increase body mass and then sent to a feedlot for finishing. Most lambs in the United States are grain-fed, leading to a milder flavor of meat (American Lamb Board, 2007). The weight of finished market lambs varies, but the average live weight is 135 pounds. Lambs sold for consumption in ethnic markets are lighter, with the average live weight ranging from 60 to 80 pounds. Finished lambs are sent to a packer for slaughter, where they are inspected and usually quality graded by USDA. The production stages have remained relatively unchanged over time, but an increase in vertical integration within the industry has prompted several stages to be per-

Figure 1. Lamb production timeline. Lamb production time varies depending on the type of meat desired.



formed by a single entity or producer-owned cooperative (Boland et al., 2007).

Lamb production occurs in all 50 states; however, flock sizes vary significantly by geographic location. Large flocks are typically located in the western part of the United States, where large tracts of land are available for grazing. In 2002, there were 6.68 million sheep raised on slightly more than 64,000 operations (USDA/NASS, Various years). As with lamb producers, lamb packers are located throughout the country. However, most facilities are located strategically near lamb feeders, consumers, or both. The amount of meat produced per animal slaughtered has increased steadily. Between 1990 and 2003, the average live weight of federally inspected slaughter lambs and sheep increased by 10 pounds. During the same period, average lamb carcass weight increased from 64 pounds to 68 pounds (USDA/ERS, 2006). About 70 percent of the carcass weight is saleable cuts, with fat and bones making up 30 percent (Boland et al., 2007).

Materials and Methods

To collect data on lamb operations' use of marketing methods, we administered a national, voluntary survey of lamb producers and feeders. The survey was administered by mail, with initial and follow-up contacts made by telephone to encourage response. Additional detail regarding questionnaire development, sampling procedures, survey administration, and data analysis follows.

Questionnaire Development

The questionnaire was designed to collect information on the use of differ-

ent types of purchasing methods, sales methods, and pricing methods for lambs; terms of purchase and sales methods (e.g., contract length); reasons for using the cash market or alternative purchase and sales methods; and operation characteristics (e.g., number of employees, annual sales). In addition, we asked respondents to indicate how their marketing practices have changed during the past three years and their expectations for how they may change over the next three years. The questionnaire was pretested and reviewed. Our pretest procedures included a review of the survey instrument using a standardized instrument review methodology and telephone interviews with five lamb producers and feeders. The draft survey instrument was reviewed by peer reviewers and Grain Inspection, Packers, and Stockyards Administration staff. The survey instrument was subsequently revised based on those reviews.

Sampling Methods

We used the most current Dun & Bradstreet (D&B) database to construct the survey sampling frame for lamb producers and feeders. The D&B database provides detailed financial and other information for businesses in the United States. The initial sampling frame included operations with a primary Standard Industrial Classification code of 0214, "sheep and goats," and the following subcategory codes: sheep, lamb feedlot, sheep-feeding farm, and sheep-raising farm. We excluded operations without reported revenue or number of employees from the sampling frame because our previous experience using the D&B database suggests that

most such business units are not currently operating. We stratified the sample by size, using annual revenue as the size criterion, so that we could report results by size of operation.

We took a census of the 80 largest operations (annual revenue greater than \$200,000) and a sample of operations from the remaining population (small operations with annual revenue less than or equal to \$200,000). The sample design specified a sample size that was expected to yield precision of +/- 5 percent or better for estimates of all proportions.

Based on the total population of 1,267 lamb producers and feeders in the D&B database, the starting sample size was 727 operations (647 small operations with annual revenue less than or equal to \$200,000 and 80 large operations with annual revenue greater than \$200,000). The eligibility rate for small operations was lower than anticipated; many operations were no longer in business or did not produce lambs. Thus, we drew and used a reserve sample of 129 small operations to have a final sample size of 776 small operations and 80 large operations.

Survey Administration

We conducted the full-scale data collection from November 2005 to February 2006. To maximize the response rate, we used a multimodal survey approach, incorporating many of the procedures recommended by Dillman (2000). We contacted sampled business units by telephone to screen for eligibility and to identify the target respondent, mailed the self-administered questionnaire to target respondents via Federal Express, mailed a reminder postcard, and made a series of telephone calls to non-respondents to encourage participation. During the data collection period, we operated a toll-free survey help line and email address that respondents could contact to request assistance when completing the questionnaire.

We received 302 completed surveys; 120 operations were eligible but did not complete the survey (i.e., nonrespondents); 215 operations were ineligible (e.g., operations that were out of business or did not produce or feed lambs); and for 219 operations we were unable to determine their eligibility for the survey. We calculated response rates

(respondents / [nonrespondents + respondents]) by size strata using the initial sampling weights adjusted for unknown eligibility so that cases with unknown eligibility were distributed between eligibles (nonrespondents) and ineligibles in the same proportions that existed among cases with known eligibility. Ineligible operations were excluded from response rate calculations. The response rate was 58 percent for large operations and 53 percent for small operations.

Data Analysis

The preparation of survey data sets involved developing survey weights, data editing, data preparation, and data coding. We developed all statistical estimates by applying appropriate survey weights that reflect the number of eligible operations. To do this, we computed initial sampling weights by size stratum, calculated adjustment factors by size stratum for unknown eligibility, and calculated poststratification adjustment factors by weighting class to compensate for nonresponse. Nonresponse adjustments ensure that, within each weighting class, respondent weights sum to the population counts of eligible operations. These adjustments can help reduce nonresponse bias to the extent that respondents within weighting classes are homogeneous (Lohr, 1999).

Questionnaires were edited to resolve data errors prior to data entry. The edited questionnaires were double keyed (i.e., 100 percent verification) into a database for quality control purposes. To resolve item nonresponse errors, we used logical imputation for some questions to assign a value to a missing response item based on responses to other questions.

While the study was national in scope, we did consider regional differences. We analyzed use of sales methods, pricing methods, and valuation methods by geographic location, comparing Eastern versus Western states. Western states included Alaska, Arkansas, Arizona, California, Colorado, Hawaii, Idaho, Kansas, Louisiana, Minnesota, Missouri, Montana, North Dakota, Nebraska, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. All other states were classified as Eastern states.

All analyses were conducted using SAS, a statistical analysis software tool that takes sample design into consideration when computing variances (SAS, version 9.1). We computed weighted proportions for questions in which respondents could select one or more responses from a list of responses, and computed weighted means for questions that required a numeric response from respondents. In addition to the point estimates for means or proportions, we also calculated interval estimates (i.e., the 95 percent lower and upper confidence intervals [CIs]). To determine whether differences in estimated

weighted means and proportions were statistically significant, we calculated *P*-values using the Student *t* distribution.

Results and Discussion

Of the 302 operations that completed surveys, 267 were small operations and 35 were large operations. Because few operations purchased lambs, we primarily focus our discussion on methods for selling lambs.

Operation Characteristics

As shown in Table 1, most operations identified themselves as lamb pro-

Table 1. Characteristics of lamb producer and feeding operations.

Question	Weighted percentage of operations	Lower bound of 95% CI ¹	Upper bound of 95% CI
Type of operation ²			
Producer	93.6	90.8	96.4
Feeder or feedlot	22.3	17.5	27.0
Other (wool producer, seedstock producer)	4.8	0.0	2.8
Total gross sales for lambs during past year			
Less than \$99,999	85.8	82.4	89.2
\$100,000 to \$499,999	9.8	6.8	12.9
\$500,000 or more	4.3	0.3	2.5
Total gross sales for all farm outputs during past year			
Less than \$99,999	78.7	74.5	82.9
\$100,000 to \$499,999	12.3	8.5	16.0
\$500,000 or more	9.0	2.7	6.4
Age of owner ³			
Less than 45	6.8	3.0	8.6
46 to 55	26.1	20.8	31.4
56 to 65	31.2	25.6	36.8
Older than 65	35.9	30.1	41.7
Education level of owner ³			
Less than high school graduate	3.7	1.4	6.0
High school graduate/GED	18.1	13.4	22.8
Some college or technical school/no degree	29.4	23.9	35.0
College graduate	32.6	26.9	38.2
Postgraduate	16.2	11.7	20.7

¹ CI = confidence interval.
² Respondents could select multiple responses.
³ For respondents in which the owner completed the survey.

ducers (i.e., lambing operations) (94 percent), while fewer operations identified themselves as lamb feeder or feedlot operations (22 percent). Thus, some lamb producers also have feeding operations. The mean area of a lamb operation encompasses 11,239 acres. Although the mean area is quite large, the average operation only employs three full-time employees, two part-time employees, and three seasonal employees. Eighty-six percent of operations reported annual gross lamb sales of less than \$99,999, and 96 percent had total annual gross lamb sales of less than \$499,999.

For most operations, the owner completed the questionnaire (92 percent). Of these, almost all respondents are more than 45 years of age and nearly one-half have a college degree (Table 1). About half of their annual household income is derived from off-farm sources, so many lamb producers rely on other sources of income.

For operations that reported having lambs in inventory on January 1, 2005, the mean inventory level was 962 lambs (Table 2). However, two-thirds of operations had fewer than 100 lambs, and 17 percent had 500 or more lambs. Most lambs are born in the spring, thus inventory levels on January 1 were likely at a relatively low level for the calendar year. Inventory levels of ewes and rams were much lower than for lambs, with mean levels of 479 and 16, respectively. Ewe and ram inventories declined by 53 percent from 1990 to 2005 (USDA/NASS, various years), although this may be partly the result of increased breeding herd efficiency (Brester et al., 2007).

The majority of lamb operations can be characterized as independent businesses that do not participate in alliances or certification programs. Less than 13 percent of lamb operations participate in certification programs that certify livestock breed, carcass, or meat characteristics. Eleven percent of lamb operations participate in some type of alliance, defined as a relationship formed by two or more industry participants to meet common production or marketing objectives and to improve information flows.

Table 2. Inventory of U.S. lamb operations as of January 1, 2005¹.

Question	Weighted mean	Weighted percentage of operations	Lower bound of 95% CI ²	Upper bound of 95% CI
Lamb inventory				
1–99	962.3			
100–499		66.5	60.3	72.6
500–1,999		16.5	11.3	21.6
2,000–9,999		7.7	4.2	11.3
10,000 or more		7.1	4.3	9.9
		2.2	0.4	4.1
Ewe inventory				
1–99	478.7			
100–499		64.8	59.3	70.2
500–1,999		18.7	14.1	23.4
2,000 or more		9.4	6.0	12.8
		7.1	5.2	9.0
Ram inventory				
1–99	15.6			
100–499		95.6	93.8	97.4
500 or more		4.4	2.6	6.2
		0.0	NA ³	NA

¹ Lamb inventories are highest in the spring, after the new crop is born. Thus, inventory levels on January 1 are likely at their lowest levels.

² CI = confidence interval.

³ NA = Not applicable.

Lamb Purchase Methods

Relatively few of the operations surveyed purchased lambs. This is because most respondents are lambing operations or feeders that self-produce their feeder lambs or only custom feed. Operations that purchase lambs bought an average of 10,368 lambs during the past year, but more than half of these operations purchased fewer than 500 lambs (Table 3). Cash market transactions dominated lamb purchases. For 83 percent of the operations that received lambs, all lambs received were through cash market transactions. During the past year, 49 percent of lamb purchases were through direct trade, 22 percent through auctions, and 13 percent through dealers/brokers (data not shown). The remaining purchases were through an AMA. Specifically, 5 percent were delivered for custom feeding, 7 percent of pur-

chases were through forward contracts or marketing agreements, and 4 percent were purchased using other methods. While overall use of the cash market has remained constant over the past few years, the prevalence of specific arrangements is changing slightly. Over time, use of auctions decreased slightly compared with 3 years ago, while direct trade increased. The most frequently cited pricing methods were individually negotiated pricing and public auction. Only 8 percent of lambs were purchased under a written agreement. Because the number of lamb operations that use AMAs for purchasing lambs is very small, we cannot characterize their reasons for using them based on the survey responses.

Lamb Sales Methods⁵

Operations that sold feeder lambs sold an average of 561 feeder lambs

⁵ The data collected in this study cannot be compared to Mandatory Price Reporting data that were collected by USDA's Agricultural Marketing Service under the Livestock Mandatory Reporting Act of 1999. Under Mandatory Price Reporting, data are only collected from lamb packers that annually process more than 75,000 lambs (i.e., the six largest lamb packers), whereas our study sampled small and large operations. Furthermore, the level of detail collected and the aggregation of data differ between the two sets of data.

Table 3. Quantities of lamb purchased and sold by lamb producer and feeder operations.

Question	Weighted mean	Weighted percentage of operations	Lower bound of 95% CI ¹	Upper bound of 95% CI
Number of lambs received or purchased during past year	10,368.4			
1-99				
100-499		42.4	24.4	60.3
500-1,999		13.5	0.6	26.3
2,000-9,999		14.1	1.5	26.6
10,000 or more		12.1	0.0	24.2
		18.0	5.1	31.0
Number of feeder lambs sold or shipped during past year	561.4			
1-99		58.0	49.4	66.6
100-499		23.1	15.4	30.9
500-1,999		9.9	4.8	15.0
2,000 or more		9.0	5.1	12.8
Number of slaughter lambs (less than 105 pounds liveweight) sold or shipped during past year	137.3			
1-99		80.9	73.8	88.0
100-499		14.8	8.1	21.4
500-9,999		4.4	0.9	7.8
10,000 or more		0.0	NA ²	NA
Number of slaughter lambs (105 pounds liveweight or more) sold or shipped during past year	2,217.9			
1-99		67.4	60.1	74.6
100-499		12.7	7.3	18.1
500-1,999		8.4	4.1	12.8
2,000-9,999		8.3	4.2	12.4
10,000 or more		3.3	0.6	5.9

¹ CI = confidence interval.

² NA = Not applicable.

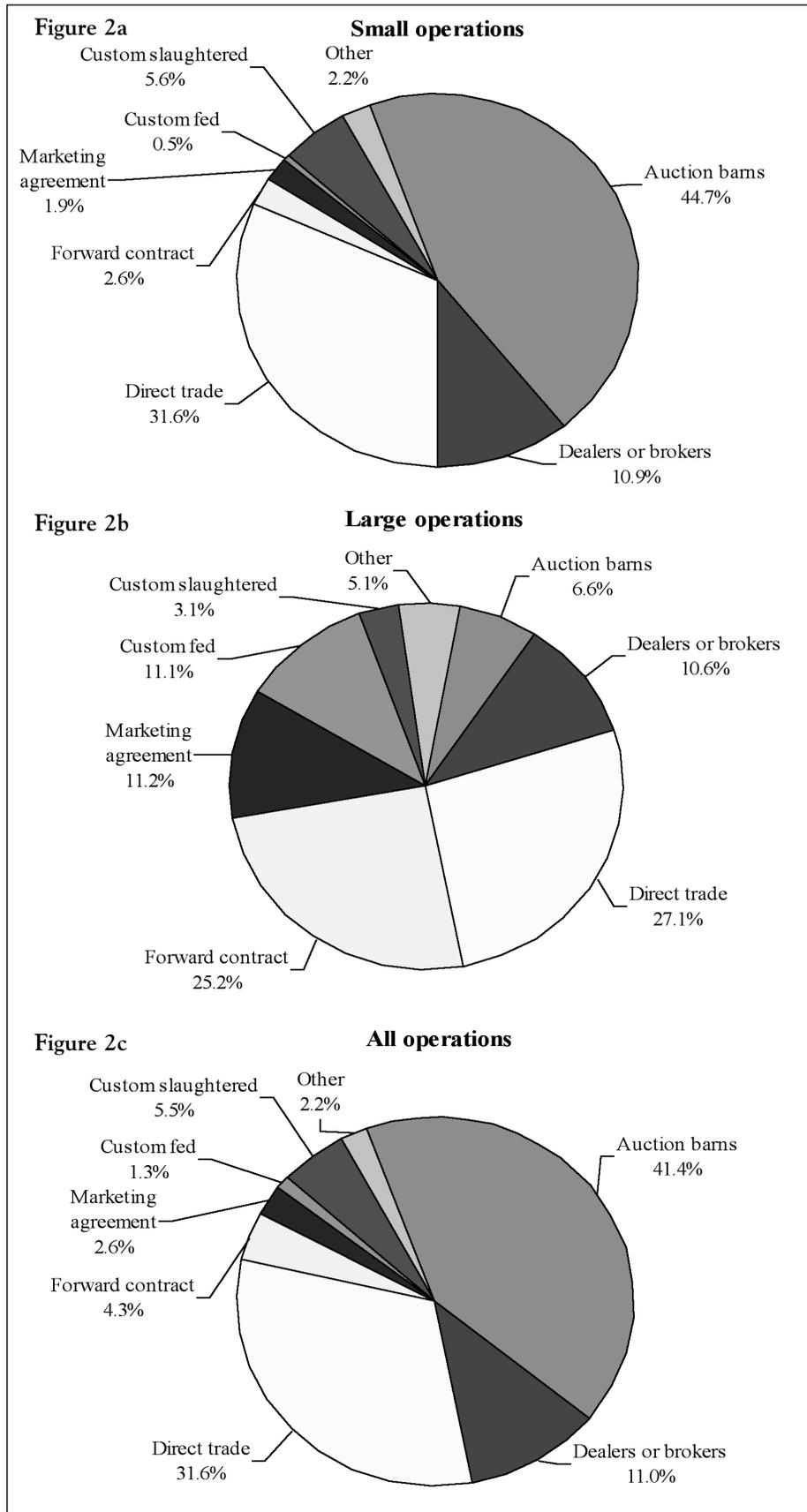
(Table 3). Operations that sold slaughter lambs sold an average of 137 lambs weighing less than 105 pounds live weight, and 2,218 slaughter lambs weighing 105 pounds or more. Almost 70 percent of operations sold fewer than 100 slaughter lambs weighing at least 105 pounds during the past year. Thus, the majority of lamb operations is small and primarily sells slaughter lambs.

Approximately 41 percent of sales were through auction markets, 31 percent through direct trade, and 11 percent through a dealer or broker (Figure 2). About 15 percent of lambs were sold or shipped through some type of AMA; specifically, 4 percent of lambs were sold using forward contracts, 3 percent using marketing agreements, and less than 1 percent using packer fed/owned or inter-

nal transfer. One percent of lambs were custom fed and 5 percent were custom slaughtered. Thus, most lambs were sold through cash market transactions (auction barns, dealers/brokers, and direct trade), with small operations (87 percent of lambs sold) having a much greater reliance on the cash market compared with large operations (44 percent of lambs sold) ($P < 0.0000$). Nearly 81 percent of small operations and 36 percent of large operations sold all their lambs through cash market transactions during the past year ($P < 0.0000$). Eastern and Western operations had similar usage of the cash market, with 80 percent and 76 percent using only the cash market, respectively. More than half of lambs sold by Eastern operations were sold using auctions, whereas direct trade and auctions both accounted for about one-third of lambs sold by Western operations. AMAs are slightly more popular among Western operations than Eastern operations (18 percent of lambs sold versus 10 percent, respectively). The survey collected information on respondents' expected use of cash markets versus AMAs over time (three years ago compared with three years in the future). The use of auctions appears to be on a slight decline, while the use of direct trade and forward contracts is increasing slightly. Overall, use of AMAs is expected to increase by 2 percent over the next three years.

Two pricing methods dominate lamb sales: public auction bids (57 percent of operations) and individually negotiated pricing (51 percent) (Table 4). Responses to the survey indicate that, in three years, public auctions and individual negotiations will continue to dominate, but the use of auctions is expected to decrease slightly while use of individual negotiations is expected to increase. Producers identified an average of four auctions operating within a 200-mile radius of their locations, which has essentially remained unchanged over the past three years. The majority of auctions closest to their operations have sales at least weekly. As shown in Table 4, small operations (60 percent) were more likely than large operations (15 percent) to use public auction bids to determine prices for lambs ($P < 0.0000$). Large operations primarily used individually negotiated pricing (61 percent), followed by formula pricing (21

Figure 2. Methods used for selling or shipping lambs (weighted mean, percentage of head). Small operations are more likely to use the cash market, while large operations are more likely to use alternative marketing arrangements.



percent).⁶ For operations using formula pricing with a grid, most prices were based on an average price paid by packers for lambs (39 percent). USDA-reported prices, retail prices, and other market prices also were used as bases for formula pricing. The top three pricing methods used by both Eastern and Western operations were individually negotiated pricing, public auction bids, and formula pricing. However, 72 percent of Eastern operations used public auction bids compared with 47 percent of Western operations.

For operations that sell slaughter lambs, the most frequently cited valuation method for both small and large operations was live weight valuation, as detailed in Table 4. Respondents expected similar use of each valuation method in three years. However, more than one-half of large operations sold lambs on a carcass weight basis with grid pricing, compared with only 5 percent of small operations ($P = 0.0027$). In comparing valuation methods among regions, Western operations used carcass weight valuation (with and without a grid) more frequently than Eastern operations (32 percent and 11 percent of operations, respectively). Nearly twice as many Eastern operations (31 percent) used per-head valuation compared with Western operations (17 percent) in the past year ($P = 0.0461$).

For more than one-half of lambs sold during the past year, the seller reported paying transportation costs (Table 4). Small operations paid to transport more of their lambs compared with large operations (54 percent versus 32 percent of transactions) ($P = 0.0176$). Less than 7 percent of all lambs were sold under a written agreement, although this was much higher for large operations (25 percent of transactions) compared with small operations (5 percent of transactions) ($P = 0.0225$). For lambs sold under a preexisting agreement, the agreement was typically less than six months. Most deliveries (66 percent) under agreement occurred within seven days, and 16 percent were delivered within eight to fourteen days. Large operations scheduled deliveries farther in advance than did small operations.

⁶ Respondents could indicate multiple pricing methods used; thus, totals sum to more than 100 percent.

Table 4. Use of and terms of sales methods for lamb operations, by size.

Question	Small	Large	All
Pricing methods used for selling lambs during the past year (weighted percentage of operations) ¹			
Individually negotiated pricing	50.6	60.6	51.3
Public auction	60.2	15.2**	57.1
Sealed bid	2.3	9.1	2.8
Formula pricing	7.7	21.2†	8.7
Internal transfer	0.4	6.1	0.8
Custom fed	1.5	18.2*	2.7
Custom slaughtered	12.0	9.1	11.8
Other	2.0	3.0	2.0
Valuation methods used for selling slaughter lambs during the past year (weighted percentage of operations) ¹			
Per head	24.6	13.3	23.9
Liveweight	76.1	53.3	74.7
Carcass weight, not dependent on grid value	13.4	26.7	14.3
Carcass weight, dependent on grid value	4.5	53.3**	7.5
Lambs sold during the past year in which the seller paid for transportation (weighted mean, percentage of head)			
	54.2	32.3*	52.4
Lambs sold during the past year under a written agreement (weighted mean, percentage of head)			
	5.1	24.8*	6.8
Length of agreement or contract (oral or written) for lambs sold during the past year (weighted mean, percentage of head)			
Sales not under agreement or contract	86.8	37.5**	82.6
Less than 6 months	7.9	43.2**	10.9
6 to 11 months	3.4	2.6	3.3
1 to 2 years	0.6	0.0	0.6
3 to 5 years	0.6	12.0†	1.6
6 to 10 years	0.0	0.0	0.0
More than 10 years or evergreen	0.6	4.7	1.0
Lead time of delivery order for lambs sold during the past year (weighted mean, percentage of head)			
Less than 7 days	68.7	33.4*	65.6
8 to 14 days	16.4	16.4	16.4
15 to 21 days	2.5	9.5	3.1
22 to 30 days	6.6	8.4	6.7
1 to 2 months	4.2	11.6	4.8
More than 2 months	1.7	20.7*	3.4

¹ Respondents could select multiple responses.

** Difference between large and small operations is statistically significant at the 0.01 level.

* Difference between large and small operations is statistically significant at the 0.05 level.

† Difference between large and small operations is statistically significant at the 0.10 level.

Reasons for Use of Traditional versus Alternative Sales Methods

The survey collected information on lamb operations' top three reasons for using traditional or alternative marketing arrangements to sell lambs. Table 5 shows reasons why operations used only cash market transactions to sell their lambs, and Table 6 shows reasons why operations used AMAs to sell their lambs. Interestingly, operations using only the cash market and those using AMAs both identified selling lambs at higher prices as a reason for using their respective methods. This may indicate that operations in each category are making optimal choices based on their own operations and local markets and thus receive higher prices by using their best option.

Greater independence, selling at higher prices, and reduced cost of selling were the three most cited reasons for using only the cash market. Small and large operations had similar reasons for only using the cash market for selling lambs. For both small and large operations, the most frequently cited reason was that the cash market "allows for independence, complete control, and flexibility of own business," although more large operations cited this reason than small operations ($P = 0.432$). Many large operations also expressed that the cash market enhances their ability to benefit from favorable market conditions.

Operations that sell lambs through AMAs believe that they can sell at higher prices, secure a buyer, and reduce risk exposure. Additionally, more than one-third of operations feel that using AMAs allows them to sell higher-quality lambs. Small and large operations had somewhat different reasons for using AMAs for selling lambs. Large operations were more concerned about reducing risk, while small operations were more interested in selling at higher prices. Seventy-two percent of small operations versus 53 percent of large operations mainly used AMAs to sell lambs at higher prices. Sixty-five percent of large operations versus 32 percent of small operations mainly used AMAs to reduce risk exposure.

Table 5. Lamb operations' reasons for only using cash market for sales, by size¹ (weighted percentage of operations).

Reason	Small	Large	All
Allows for independence, complete control, and flexibility of own business	59.8	84.6**	60.7
Can sell lambs at higher prices	44.2	46.2	44.3
Reduces costs of activities for selling lambs	33.7	23.1	33.3
Enhances ability to benefit from favorable market conditions	32.2	46.2	32.7
Does not require identifying and recruiting long-term contracting partners	16.6	15.4	16.5
Does not require managing complex and costly contracts	16.1	23.1	16.3
Allows for adjusting operations quickly in response to changes in market conditions	15.1	38.5	15.9
Reduces risk exposure	15.1	15.4	15.1
Allows for sale of higher-quality lambs	14.1	0.0**	13.5
Facilitates or increases market access	11.6	0.0**	11.1

¹ Respondents were asked to select three reasons.

** Difference between large and small operations is statistically significant at the 0.01 level.

* Difference between large and small operations is statistically significant at the 0.05 level.

Nearly 81 percent of small operations compared with 36 percent of large operations sold all their lambs through cash market transactions during the past year. It may be more difficult for small operations to participate in AMAs because it is more costly for packers to negotiate with many small operations relative to fewer large operations. Compared with large operations, small operations are more likely to incur transportation costs, less likely to use written contracts, and more likely to schedule delivery less than two weeks ahead for lamb purchases and sales.

The cash market dominates Eastern and Western sections of the United States, with both sets of producers selling more than 80 percent of their lambs through cash methods. The use of auctions is more popular in the East, while Western operations are more likely to use both auctions and direct trade to sell lambs. Greer and Ward (2000) and Ward (2001) found similar results in their analyses of lamb sales data from 1996. Western operations use AMAs more than Eastern operations, although this may be a reflection of operation size differences between the two regions. Williams and Davis (1998) found that large-range operations, more common in the West, primarily use contracts to sell lambs, whereas smaller-flock operations, located in the East, prefer to use auctions and other cash methods.

Conclusion

The U.S. lamb industry primarily uses the cash market to purchase and sell lambs. Lamb operations believe that the cash market allows them to be independent, with complete control and flexibility over their business. Lamb operations prefer to act on their own, with few employees and little involvement in alliances or certification programs.

In procuring lambs, there appears to be a slight trend away from auction markets toward other types of cash market transactions, such as direct trade. This trend of moving away from auctions is also evident in selling lambs. Although the results are relatively minor and are not statistically significant, the survey data do show a trend that is worth noting.

Using the cash market to sell lambs was more widespread among small operations than among large operations.

Table 6. Lamb operations' reasons for using AMAs for sales, by size¹ (weighted percentage of operations).

Reason	Small	Large	All
Can sell lambs at higher prices	72.0	52.9	66.5
Secures a buyer for lambs	48.0	41.2	46.0
Reduces risk exposure	32.0	64.7*	41.4
Allows for sale of higher-quality lambs	40.0	29.4	37.0
Reduces price variability for lambs	20.0	17.6	19.3
Reduces costs of activities for selling lambs	16.0	17.6	16.5
Facilitates or increases market access	12.0	5.9	10.2

¹ Respondents were asked to select three reasons.

* Difference between large and small operations is statistically significant at the 0.05 level.

Lamb producers and feeders expect small increases in their use of AMAs when selling fed lambs in the future. This increase can have several implications for the industry. Operations using AMAs find that they can maintain market access, reduce risk, and get rewarded for high-quality lambs. The use of AMAs is one of the few risk-management tools available to operations, because there is no futures market for lambs. Use of marketing methods for ensuring higher- or more consistent-quality lambs may enable U.S. operations to more effectively compete with increasing foreign imports.

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