Custom Dairy Heifer Grower Industry Characteristics and Contract Terms

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ABSTRACT

This study examines a national survey of professional custom heifer growers. Sixty-five respondents from 23 states provided information on operation size and characteristics, management practices, and contract terms. Responding operation current heifer inventories ranged from 30 to 20,000 heifers and the average operation had more than 1200 heifers on-farm. The regional pattern of operation size was similar to the regional pattern of dairy farm size with heifer grower operations in the West and South regions being larger, on average, than those in the Midwest and Northeast regions. On average, 71% of total income was derived from the heifer-growing enterprise. Operations in the Northeast region derived the highest percentage of income from heifer growing while operations in the South region derived the least income from heifer growing activities. Many operations entered business to utilize excess facilities, labor, or feed. A majority of the operations had two to five dairy farm clients. Sixty-nine percent of respondents used some form of written contract. Just over 50% of the respondents indicated that a set daily charge per heifer per day was the primary type of contract payment. Although the most common charge was \$1.50 per heifer per day, average daily charge was \$1.52/heifer. Operations that took heifers from prior to weaning through to prefresh charged a weighted average daily charge of \$1.60 per heifer. Explaining price charges as a function of characteristics and contract terms revealed that size and number of clients were negatively related to price while specialization in heifer growing was positively related to price charged.

(**Key words:** heifer management, custom heifer growing, national survey)

INTRODUCTION

Whereas US dairy farms have been increasing in size and specialization for decades, recent years have

witnessed an acceleration of these trends. As a dairy farm specializes in milking cows, other enterprises are curtailed. Management, labor, and capital constraints may necessitate a movement towards outsourcing activities that were once a part of the smaller, but more diversified, dairy operation. One increasingly common example of outsourcing among dairy farmers is utilizing a custom replacement heifer grower.

Contracting or outsourcing the dairy heifer enterprise has several advantages and disadvantages for both the dairy farmer and heifer grower. The major advantages to the dairy producer include the potential to free labor, management, feed, or facilities for use by the milking herd. Disadvantages may include increased cash outflow, loss of management control, biosecurity risks, and potential for conflict (Wolf and Harsh, 2001). With respect to the custom grower, commercial heifer raising presents a potentially profitable business opportunity that may productively utilize existing facilities, labor and management (Endsley et al., 1996).

With little objective and comprehensive information about commercial custom heifer growers available, a survey was undertaken to examine custom heifer growers including operation size, management practices, and contract terms. The survey gathered information on a wide variety of variables related to the structure and operation of the custom heifer grower industry, including current farm size, facilities and production methods, operator and labor characteristics, and contract terms and incentives. Survey results and analysis presented here may be useful for existing custom heifer growers, dairy farmers, dairy industry personnel, and others interested in the custom heifer growing business.

MATERIALS AND METHODS

Surveys were sent to 187 potential dairy heifer growers identified either through their membership in the Professional Dairy Heifer Growers Association or through feed industry contacts. In spring 2001, the survey was mailed to 27 states geographically distributed across the lower 48 but concentrated in major dairy-producing states. Seventy-two surveys were returned,

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representing a 38.5% response rate. Sixty-one respondents identified themselves as current custom heifer raisers. Four respondents were growing their own heifers for sale and one was in transition to becoming an active heifer grower. Five respondents indicated that they were not growing heifers and had no plans to participate in the business.

Only those respondents who were active heifer growers were included in the summary statistics reported (a total of 65 potential respondents for each question). When examining the results, the summary statistics presented are accompanied by the "number of farms reporting", which indicates the total useable responses or respondents to a given question. Consistent with Michigan State University research requirements, survey respondents had the option to answer, or decline to answer, individual questions at their discretion. In addition, some questions allowed for multiple responses.

Responding operations were located in 23 states. States were divided into four geographic regions to allow further description and analysis. Regions and associated states with respondents include:

- 1) Midwest: Iowa, Illinois, Indiana, Kansas, Ohio, Minnesota, Missouri, Wisconsin;
- 2) West: California, Colorado, Idaho, Nebraska, New Mexico, Utah, Washington;
- 3) Northeast: Massachusetts, New York, Pennsylvania; and
- 4) South: Florida, Georgia, South Carolina, Texas, Virginia.

The Midwest region produced 29 completed surveys, and the other three regions produced 12 each.

RESULTS AND DISCUSSION

The survey results are organized into three sections. The first focuses on farm and operation characteristics; the second examines the heifer management practices; the third includes contract specifications including payment rates, risk sharing clauses, and incentives. Following the results summary, survey data are used to examine factors behind pay rates charged by heifer growers, including risk distribution and raising costs across regions, operation size, specialization, and other relevant characteristics.

Farm and Operator Characteristics

The average operation across the 65 respondents had a current inventory of more than 1200 heifers at the time of the survey (Table 1). Because many operations kept heifers less than a year, the average operation finished nearly 1700 heifers annually. Operations

Table 1. Average farm size.

	Average	Standard deviation	Minimum	Maximum
Heifers				
Current inventory	1224	3050	30	20,000
Capacity	1492	3650	30	60,000
Finished annually	1694	7647	20	25,000
	ha			
Land				
Owned	187	397	0	3043
Rented	75	93	0	425
Total operated	258	450	4.5	3448
	Heifers/ha			
Heifer density	9.21	28.35	0.56	172.97

ranged in size from 30 to 20,000 heifers currently on the operation. The average respondent operated 258 ha, of which 187 hectares was owned and another 75 ha rented (Table 1). Almost half of the heifer raising operations had between 250 and 1000 heifers on-farm. Large heifer operations were equally as likely to be on a relatively small land-base as they were on a large land-base. Mid-sized heifer operations were associated with large crop enterprises, whereas the large heifer operations specialized in heifer growing. On average, respondent operations had a heifer density of 9.21 heifers/ha operated with a maximum of 173 heifers/ha and a minimum of 0.56 heifers/ha.

With respect to regional average size, the pattern was similar to that of average milking herd size. The largest heifer operations, on average were in the West region (Table 2). Followed by the South, Midwest, and Northeast. The average heifer operation in the West region owned the majority of total land operated and rented fewer acres relative to operations in the other regions which rented more acres and were less specialized. With respect to heifer density, the average operation in the West region was more densely populated than the average operations in other regions.

Table 2. Average farm size by region.

	Midwest	West	Northeast	South
Heifers				
Current inventory	553	4215	384	693
Capacity	655	4860	483	926
Finished annually	565	6768	247	513
	ha			
Land				
Owned	130	427	78	155
Total operated	218	429	120	267
	Heifers/ha			
Heifer density	8.98	24.88	2.17	3.31

Table 3. Other current farm enterprises.

	US	Midwest	West	Northeast	South
	(% of responses)				
Milking herd	7.9	7.7	0	0	11.8
Cash crops	39.7	41.0	21.4	20.0	17.6
Other livestock	33.3	23.1	28.6	20.0	29.4
None	20.6	17.9	35.7	46.7	17.6
Other	33.3	10.2	14.3	13.3	29.4
Responses ¹	85	39	14	15	17
Operations	65	29	12	12	12

¹Multiple responses were possible.

Many respondents indicated that heifers were not the only farm enterprise (Table 3). Crop enterprises complemented the heifer growing enterprise and were the most common other farm enterprise. Many operations included other livestock enterprises. Examining the mix of existing farm enterprises across geographic regions revealed that milking herds were more common on Midwest farms than in other regions. Heifer growers in the West and Northeast regions were the most specialized in heifer growing.

On average, 71% of total income came from the heifer operation, 21% from other farm enterprises, and 8% from off-farm sources (Table 4). Forty-three percent of all respondents indicated they received off-farm income. The South region respondents had the largest average percentage of income from off-farm sources (22%) and the least total income from custom heifer growing (56.5%). The Northeast region had the largest average percentage of total income derived from the heifer growing enterprise (81.2%).

The survey also gathered information about who the custom growers operators were and how they became custom heifer growers. The principal operator held a full-time off-farm work on only about 10% of the responding operations. One-half of the responses indicated that heifer growing was their primary business. The other respondents were either operations with other farm enterprises or off-farm employment in addition to the heifer-growing endeavor.

Respondents indicated many reasons for entering into custom heifer growing. The most common response was for the business opportunity (Table 5). The second most common response was to utilize forage crops

grown by the operation. Using or capturing the fixed-costs on unused livestock facilities was also indicated as a common motivation for the custom heifer growing business enterprise.

Thirty of 56 respondents, 53%, indicated that they previously had a milking herd. Growers who previously had a milking herd were more common in the Midwest (17 of 23 respondents) and Northeast (9 of 12 respondents) regions. Respondents in the South and West regions were less likely to have previously had a milking herd. Thirteen respondents indicated that they had moved into dairy heifer growing from other livestock enterprises. Reasons for eliminating previous farm enterprises included personal preferences (26.3% of respondents), tight profit margins (22.5%), lack of available labor (18.8%), and outdated milking facilities that would require substantial new investment (17.5%).

Management Practices

Examining management practices utilized provides a foundation for understanding current industry standards. The number of dairy farms that sent heifers to the grower varied widely, 83% of respondents raised heifers for more than one dairy producer, whereas the remaining 17%, 11 operations, raised heifers exclusively for a single dairy producer (Table 6). The simple average number of dairy farm clients was 5.8. Examined by region, the largest group in each geographic region was two to five dairy farm clients which characterized at least 50% of respondents in every region. One operation in the West region indicated that they raised heifers for more than 20 clients.

Biosecurity concerns may discourage comingling heifers on custom raiser operations. Thirty of 62 respondents, 48%, indicated that heifers were quarantined from other heifers for a period of time when they arrived on-farm. This value is larger than that indicated by the National Animal Health Monitoring System in 2002, which found that only 37% of calves and 19.6% of bred heifers were quarantined upon arrival (USDA-APHIS, 2002). However, only 6 of 57 farms permanently separated heifers according to dairy herd origin.

Initial contact between the heifer grower and the dairy farm client occurred by many different sources. The most common method was through an acquaintance or neighbor followed in popularity by using a third party. Responding custom heifer growers were also asked to comment on the primary reason that clients sent heifers to them. Dairy farms were more likely to outsource heifer growing during herd expansion (Table 7). About 91% of dairy farms expanded their milking herd after sending heifers to the custom grower while only nine percent had not. Lack of heifer facilities, man-

Table 4. Average income source distribution.

	US	Midwest	West	Northeast	South
	(% of total income)				
Heifer enterprise	70.8	68.6	77.1	81.2	56.5
Other farm income	22.1	24.5	21.7	17.0	21.5
Off-farm income	7.0	6.9	0.8	1.8	22.0

Table 5. Reason for entering heifer growing.

	US ¹	Midwest	West	Northeast	South
	(% of respondents)				
Good business opportunity	31.6	29.2	50.0	29.0	29.2
Utilize existing livestock facilities	22.2	26.6	16.7	16.1	20.8
Regular working hours	12.0	13.9	8.3	19.3	12.5
Use and marketing of forage crops	25.9	27.8	16.7	25.8	33.3
Other ¹	8.2	2.5	8.3	9.7	4.2
Total responses ²	158	89	36	33	25

¹Other included quality of life issues and utilizing excess available labor.

²Sixty-five respondents often indicated multiple reasons.

agement time, and labor were the next most common reasons heifers were sent to the custom growers and all could also be related to dairy herd expansion.

Facilities used by custom heifer growers included free-stall barns, bedded packs, and pastures (Table 8). Many operations utilized more than one type of facility. Sixty-five percent of respondents (42 of 65) indicated that they had built or purchased new facilities to raise dairy heifers. Investment in heifer growing averaged \$132,617 in machinery and equipment and \$259,788 in buildings and facilities. This investment averaged \$731 per heifer total investment for heifer growing purposes, \$287/heifer for machinery and equipment and \$443/heifer for buildings and facilities.

Consistent with facilities and labor constraints as well as the needs of dairy farm clients, respondents indicated a wide range of heifer ages into and out of the custom operation. The most common age that heifers entered was following weaning—after 2 mo of age and before 6 mo. Most common exit age group from grower operations was after breeding (83% of responses). The survey did not enquire whether heifers were confirmed pregnant before exit.

The heifer grower was responsible for breeding heifers on most operations. Most exceptions involved a third party responsible for breeding. With respect to breeding methods, 58% of all operations used only AI, whereas 77% used at least some AI. Thirty-six respondents indicated that at least some heifers were bred by dairy bulls, whereas eight indicated some used beef bulls. This use of bulls as a component of the breeding pro-

gram, nearly 68% of operations, is higher than indicated across US dairy operations by the 2002 National Animal Health Monitoring System, 55% (USDA-APHIS, 2002).

Age at first calving determines when the heifer becomes a productive member of the milking herd. Previous studies suggest that the optimal age at first calving is at or just less than 24 mo (Hoffman and Funk, 1992; Heinrichs, 1993). Reduced age at first calving results in savings in feed costs, overhead, and crowding in heifers (Heinrichs, 1993; Tozer and Heinrichs, 2001). These costs savings are passed on to the dairy farmer in the case of custom-raised heifers. Respondents indicated that most heifers were bred initially between 13 and 15 mo. If the initial breeding was successful, age at first calving would be 22 to 24 mo. A standard goal is 24 mo for first calving and averaging that age requires that initial breeding occur earlier than 15 mo. Of the 56 respondents that answered the survey question regarding age at first breeding, only 13 indicated initial breeding occurred after 15 mo of age.

Several criteria were used to determine when the heifers were ready for breeding. The average age criterion was 13.5 mo (38 respondents). Forty respondents indicated that weight was a criterion, with an average breeding weight standard of 363.6 kg. Eighteen respondents indicated that height, was a criterion with the average height standard being 127 cm. With respect to average daily gain, most heifers above 6 mo of age were targeted for 0.8 to 0.91 kg/d.

Table 6. Number of clients.

Number of clients	US	Midwest	West	Northeast	South
	(% of respondents)				
1	17.7	7.4	25.0	25.0	27.3
2–5	58.1	63.0	50.0	58.3	54.5
6–10	11.3	11.1	8.3	8.3	18.2
11–20	9.7	18.5	0.0	8.3	0.0
>20	3.2	0.0	8.3	0.0	0.0
Respondents	62	27	12	12	11

Table 7. Primary reason farmer clients outsourcing heifer growing.

Binding constraint	Responses ¹	Percentage of responses
Facilities space to expand milking herd	37	24.2
Lack of sufficient heifer facilities	33	21.6
Labor	29	19.0
Feed	15	9.8
Management time	33	21.6
Other	6	3.9
Total	83	100.0

¹A total of 60 respondents answered this question; many indicated multiple reasons.

Contract Specifications

Contracts are important to formalize expectations and arrangements between the dairy farmer and custom grower. Sixty-nine percent of respondents used some form of written contract. The majority of respondents, 85%, contracted directly with their dairy farm clients rather than using a third-party intermediary.

Many different payment schemes were utilized; sometimes several methods were used by a single heifer grower. However, just over 50% of the respondents indicated that a set daily charge per heifer per day ("daily charge" method) was the primary type of contract payment (Table 9). The second most common single methods were purchasing the heifers from the dairy farmer and later selling them back ("sell-buy back" method) and a rate based on weight gain ("gain-based" method). Combinations were also indicated by 10 farmers (15%) as the primary method to determine payment rate, but all combinations used either daily charge or sell-buy back method as part of the combination. When examining contract type across heifer size, several patterns emerge. Both sell-buy back and gain-based contracts were not used by the smallest of heifer growers, who relied almost exclusively on the daily charge method.

The dominant payment method in the Midwest, West, and Northeast regions was a fixed daily charge per head. In the South region, the single most common method was based on rate of gain. Five of eight sell-buy back arrangements were in the Midwest region.

Table 8. Heifer facilities.

Facility type	Responses ¹	Percentage of responses
Free stalls	28	25.9
Bedded pack	37	34.3
Pasture	29	26.9
Other	14	13.0
Total	108	100.0

¹Many respondents indicated the presence of multiple types of facilities.

Table 9. Primary contract payment method.

Contract type	Number of respondents	Percentage of respondents
Daily charge per head per day	32	51.6
Sell-buy back	8	12.9
Gain based	8	12.9
Feed cost plus yardage	1	1.6
Set payment per heifer	3	4.8
Combination of methods	10	16.1
Total	62	100.0

Of respondents that used daily charge, the most common charge was \$1.50/heifer per day and the average daily charge was \$1.52/heifer. Fifty-one percent of the respondents indicated an average charge between \$1.40 and \$1.60/heifer per day. By age group, the average charge was \$1.88/d from birth to weaning; \$1.49/d from weaning to 6 mo of age; \$1.50/d from 6 mo to breeding; and \$1.59/d while bred. These charges reflect the fact that calves require more labor and relatively expensive milk-replacer prior to weaning and thus is the most expensive growth period in terms of average cost per day (Bernard et al., 1992; Karszes, 1994). Operations that took heifers from prior to weaning through to pre-fresh charged a weighted average daily charge of \$1.60 per heifer. Whereas only 10 respondents indicated a gain-based charge, the range of rates was quite wide. Half of the respondents charged between \$1.65 and \$2.18/kg (\$0.75 and \$0.99/lb) of gain.

Payments were mostly received monthly (70%). Nineteen respondents, 28%, indicated that payment was received when the heifer was returned to the client. Respondents indicated multiple arrangements depending on the client.

Contracts contained performance bonus clauses in only eight instances. The most common bonus utilized was related to a target rate of gain. Responsibility for veterinary bills was shared 11% of the time (Table 10). Shipping mortality was most often the responsibility of the dairy farmer. Heifer mortality on the heifer grower operation was shared in some cases and in others depended on the length of time on the operation (or since arriving from the dairy farm).

Some other contract or monitoring considerations were also gathered by the survey. About 23% of the

Table 10. Financial responsibilities.

	Veterinary bills	Shipping mortality	Mortality on-farm
	(% of responses)		
Custom grower	71	25	40
Owner/farmer	17	67	23
Shared	11	8	37
Total responses	63	61	62

Table 11. Explaining daily heifer growing charges.

Variable ¹	Description	Coefficient ²	<i>P</i> > <i>t</i>
Constant		1.228	0.000
West ³	1 if true 0 else	-0.083	0.315
Northeast ³	1 if true 0 else	0.119	0.124
South ³	1 if true 0 else	-0.233	0.038
Size	Current heifer inventory	-0.00006	0.002
Specialization	Percentage of income from heifers	0.255	0.029
Facility	1 if free stall 0 else	-0.185	0.010
Number of clients		0.015	0.001
Veterinary bills	% grower responsibility	0.093	0.215
Shipping mortality	% grower responsibility	0.249	0.001
Mortality on farm	% grower responsibility	-0.117	0.082
Performance clauses ⁴	1 if true 0 else	-0.057	0.390
Third party monitor ⁵	1 if true 0 else	0.068	0.381
Third party provides feed	1 if true 0 else	0.239	0.034
Farmer provides supplies ⁶	1 if true 0 else	0.159	0.015
Third party provides supplies	1 if true 0 else	0.065	0.566
R ²		0.604	

¹The dependent variable is heifer growing charge expressed in dollars per heifer per day.

²Coefficients can be interpreted as dollars per day attributed to that explanatory variable.

³Dummy variable for region that indicates difference from Midwest (the omitted region).

⁴"Performance clauses" are contract clauses with financial incentives for achieving heifer growth, breeding, or health standards.

⁵A "third party monitor" is someone other than the client that checks heifer performance or provides feed or supplies.

⁶"Farmer" indicates dairy farm client who supplies included medicines and semen.

operations (14 of 62) indicated that heifer performance was monitored by an outside party. Thirty percent of the operations (17 of 56) responded that financial adjustments were made for sick or poorly performing heifers. Thirty-six percent of respondents (18 of 50) indicated that the dairy farmer had the option to refuse payment if heifer performance standards were not met.

Considering the overall satisfaction with the contract arrangement, most custom heifer growers were "satisfied" (37% of respondents), had "above average satisfaction" (39%), or were "extremely satisfied" (21%). The remaining three respondents were "somewhat satisfied" with their contract arrangement. None of the 62 respondents to this question indicated dissatisfaction with their current contract.

Explaining Heifer Raising Charges

Of paramount importance in a contract growing arrangement are financial terms and division of responsibilities. Financial terms may be thought of as a function of the farm, operator, region, facilities, and practice characteristics. To examine the effect of these charac-

teristics and practices, a simple regression was run with average daily charge as the dependent variable. More than half of the respondents used daily charge as the primary method to bill dairy farm clients. Several other respondents used this method in combination with other methods. In the remaining cases, the other pricing methods were converted to an average daily charge using information provided. For example, a gain-based charge was converted to an average daily charge using on average daily rate of gain information provided.

Explanatory variables of the heifer charges included region, operation size, specialization of the heifer grower operation, heifer facilities, number of clients, and a number of contract clauses such as bonuses, distribution of financial responsibilities, presence of a third party for monitoring, responsibilities, and performance clauses. Variables and regression results are in Table 11. The regression explained 60.4% of the variation in price charged.

Operation size was measured by average number of heifers on hand and is expected to capture any economies of size considerations. Region is represented by a dummy variable and captures common regional factors

such as weather and geography. To avoid the dummy variable trap, the Midwest is the omitted region so that the regional variables should be interpreted as mean difference from the Midwest charge. Only the South region had a significantly different average charge than the Midwest being on average \$0.23 less per heifer per day (at $P < 0.05$). The West region tended to have lower charges than the Midwest, whereas the Northeast region tended to have higher charges. This is true even controlling for economies of size. As expected, larger farms charged a lower price likely reflecting lower costs of \$0.06 for every 1000 heifers on-farm.

Specialization was measured as the percentage of income derived from the heifer-growing enterprise. Perfect specialization indicated that all income came from the heifer enterprise. Specialization was associated with higher charges with a perfectly specialized heifer operation charging \$0.255 per heifer per day more, all other factors equal.

Facilities were entered as a binary variable equal to one for free stalls and zero for other facility types. Use of free stalls was associated with lower charges relative to other facilities, the most common of which were pasture and bedded pack. Free stalls were more common in the Northeast and Midwest regions, which also tended to have smaller operations both of which may contribute to the negative sign on the facilities coefficient.

Number of clients was positively related to the price charged. Each additional client was associated with a \$0.15 daily charge increase. Heifer grower responsibilities were entered as a binary variable where one reflected grower responsibility and zero meant not. Grower responsibility for shipping mortality added an average of \$0.249 per heifer per day. Mortality on the heifer grower operation was negatively associated with price but not at a statistically significant level.

A contract agency or third party providing the feed, similar to the arrangements on many hog production contract farms, was associated with an average charge increase of \$0.239 per heifer per day. This result seems to run counter to intuition. However, this may reflect the fact that the heifer grower cannot take advantage

of home-grown feed or add a profit margin to their own available feed supplies when a contract agency provides feed. Supplies were specified as medicine, such as vaccines, and semen. In cases where the farmer provided the supplies, the charges were \$0.159 higher.

CONCLUSIONS

This study examined results of a survey of professional dairy heifer growers. Respondents from 23 states completed the survey. Results revealed that economies of size, specialization, number of clients, and responsibilities for mortality, feed, and supplies costs explained more than 60% the variation in price charges. Summary characteristics, practices, and contract terms provide a benchmark for those interested in learning more about the increasingly important custom heifer grower sector of the dairy industry.

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