COMPARISON OF DAIRY VERSUS BEEF STEERS

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Introduction

Approximately one-fifth of the United States cow herd is made up of dairy cows and 15 to 20% of fed beef steers are Holstein. Therefore it is important to understand the comparative value of Holstein and beef type breeds for beef production. This presentation will summarize the research literature and compare feedlot closeout information from Holstein and beef cattle from a large, national database.

Research Literature Summary

Feedlot Performance

Table 1 summarizes results from 13 trials between 1959 and 2004 involving 1559 head of steers. The early literature documents growth and performance advantages for Holstein cattle as compared to British beef breeds. Kidwell and McCormick (1956) found Holstein steers to gain more rapidly and require less grain per unit of gain than Hereford steers. Garcia-de-Siles et al. (1977), using Holstein and Hereford steers placed on feedlot rations at approximately 270 d of age, were fed to two slaughter weight endpoints of 900 and 1100 lb. At 280d, 365d, and harvest, weight per day of age was 16%, 18%, and 22% greater ($P<0.01$) for Holsteins than Herefords, agreeing with results from Martin and Wilson (1974) where weight per day of age for Hereford steers was significantly less ($P<0.05$). Moreover, in the same study, feed efficiency from 270 d to harvest was 13% more desirable for Holstein cattle, allowing them to reach slaughter weight at an average of 83.3 d younger than Herefords ($P<0.01$). More recent research concurs with these findings. A comparison of individually fed Angus, Polled Hereford, and Holstein steers (Thonney, 1987), found dry matter intake was numerically greater for Holstein steers when compared to Angus and Polled Hereford steers. Additionally, Holstein steers gained 11% faster ($P<0.005$) than the average of Angus and Polled Hereford steers, resulting in Holstein steers being more efficient ($P<0.025$). Holstein steers required 6% and 9% less DM per unit of gain than Polled Hereford and Angus steers, respectively. Similarly, Thonney et al. (1981) reported that Holstein steers gained .44 lb/d faster and required 1 lb less dry matter per lb of gain than traditional, small frame Angus steers from 880 to 1100 lb. In a series of studies conducted at Cornell University, Holstein and British beef breed steers were compared at carcass endpoints between 600 to 800 lb and carcass quality grades of 60 to 100% USDA Choice (Perry and Fox, 1992). They concluded weight, daily gain, days on feed and total weight gain were similar between Holstein and beef breed steers, however, dry matter intake was higher ($P< 0.01$) , and gain per unit of feed was lower ($P< 0.01$) for the Holstein steers.

In summary, the average dietary NE_g value of the diets fed in the 13 trials was 56 Mcal/cwt. This is considerably less than the 62-68 Mcal/cwt NE_g diets currently used in the industry. The Holstein steers were started on feed at lighter weights than beef breed steers (529 vs. 559 lb, weighted average) and finished at heavier final weights (1003 vs. 925 lb). Daily weight gains for Holstein and beef steers were similar (2.72 vs. 2.79 lb). Beef steers gained more weight per day in only 6 of the 13 trials. Holsteins consumed 3.7% more DM per day (18.39 vs 17.71lb/d) than the beef steers. DM intake expressed as a percent of body weight was similar. Numerically, Holsteins consumed more DM per day in 9 out of the 11 reported studies. A small but consistent (10 out of 12 studies) benefit in feed conversion efficiency was noted for the beef steers (6.68 vs 7.13). Overall, the summary indicated performance was similar between Holstein and beef steers. However, differences in environment and feeding conditions existed over the 45-year period.

Carcass Characteristics

Garrett (1971) found Holstein steers to have lower dressing percent (DP) than beef type steers. Martin and Wilson (1974), found Hereford steers to have more ($P<0.001$) backfat and larger ($P<0.01$) ribeye muscle area (REA), however, Holstein cattle were higher in cutability ($P<0.01$). This corresponds with results from Nour and collaborators (1983) who reported Angus carcasses have 1.1 in^2 larger ($P<0.005$) REA than Holstein carcasses at any chilled carcass weight. Likewise, Knapp et al. (1989) reported numerically larger REA for English breed cattle over Holstein cattle and significantly larger ($P<0.05$) REA for exotic breed cattle than Holsteins. In addition, Knapp et al. (1989) reported Holstein cattle to have significantly more ($P<0.05$) KPH, and significantly lower ($P<0.05$) yield grade (YG) and DP than British cattle.

In a review by Henderson (1969), it was concluded that Holstein cattle yielded a higher percent of their carcass weight in boneless trimmed retail cuts. These results are consistent with less fat cover and larger gastrointestinal tracts relative to body weight in Holsteins as compared to beef steers. This same review of the literature found Holstein cattle to produce carcasses with carcass grade and marbling scores below that of beef type cattle. A lower conformation score for Holsteins was primarily responsible for the lower grading carcasses.

In an eleven trial summary Table 2), Holstein steers were fed 47 d longer ($P<.08$) than beef steers. Holstein steers had a lower dressing percentage (59.1 vs. 61.9%; $P<.003$) than beef steers but similar carcass weight. Holsteins also had less backfat (0.3 vs. 0.7 in.; $P<.0001$) and a smaller ribeye area (12.0 vs. 10.8 in^2; $P<.002$) than beef steers. Kidney, heart and pelvic fat, marbling and USDA calculated yield grades were similar among the two steer types in this summary. Initial weight, age, days on feed, harvest weight, environment and feeding practices can have a significant impact on carcass characteristics. However, the high probability levels for differences in dressing percent, backfat, and ribeye between Holsteins and beef steers firmly establishes these differences across a variety of production variables.

Palatability

Sensory attributes determine the consumer acceptability of trimmed beef cuts. Price differentials between quality grades are indicative of the emphasis the beef industry has placed on sensory attributes (Armbruster et al., 1983). There are conflicting reports in the literature regarding the relationship between tenderness and quality grades. Campion et.al. (1976) reported taste panell tenderness and overall acceptability has been found to be related (*P*<0.05) to the quality grades of 494 steers. Contrarily, Crouse et.al. (1978) reported less than 5% and 7% of the variation in tenderness and overall acceptability, respectively, were explained by quality grade. Armbruster and others (1983) conducted a trial using Angus and Holstein steers fed either corn grain or corn silage diets and housed inside in individual pens or outside in conventional, partially covered paved lots. The cattle were harvested at one of five weights ranging from 797-1197 lb for Angus and from 1000-1397 lb for Holstein. Roasts from Holstein cattle that scored in the slight to moderately abundant degree of marbling categories had better flavor than those of Angus cattle. However, at marbling scores above moderately abundant, Angus roasts were found to be more flavorful. The latter was possibly due to accumulation of more fat associated with higher marbling scores. The magnitude of the difference in flavor is of questionable importance. No differences were found in juiciness between the two breeds of cattle, nor did breed difference impact tenderness at any of the weight endpoints.

Branaman et al. (1962) found no significant differences for Warner-Bratzler shear force values, sensory panel tenderness ratings, aroma ratings, flavor of fat and texture of lean between beef and dairy-type cattle. The flavor of the lean from beef-type cattle was rated higher for intensity (*P*<0.01) although scores for desirability were not significantly different. The quantity and quality of juiciness were superior (*P*<0.01) for the beef-type cattle. The higher scores for juiciness for the roasts from beef-type cattle are probably a result of a greater amount of marbling, which has been positively correlated with juiciness. In a study comparing meat from Hereford, Milking Shorthorn, and Friesian steers (Callow, 1961), overall palatability was similar. Cole et al. (1964) and Ziegler et al. (1971) observed more marbling in Herefords than Holsteins at similar weights. Herefords also had higher flavor, juiciness, and overall acceptability scores. In a comparison of Hereford and Holstein steers harvested at two weight end-points, Garcia-de-Siles (1977), reported higher (*P*<0.01) mean flavor and marbling scores for Herefords. In studies comparing Holstein to Angus, Simmental or Angus crossbred steers, sensory evaluations of rib steaks were acceptable for all cattle, although Holstein steers were more tender (*P*<0.01) and had a higher overall acceptability (*P*<0.05) than beef breed steers (Thonney et al., 1991; Perry and Fox, 1992). Judge et al. (1965) found few differences in subjective and objective tests for appearance, palatability and cooking characteristics of *Longissimus dorsi* steaks of Holstein, Red Dane crossbred, Dual-purpose, Angus I (17 mo of age) and Angus II (14 mo of age). The only differences reported were Angus I having higher (*P*<0.01) moisture and lower tenderness scores ($P<0.01$) than Angus II. Additionally the marbling scores for steaks from Angus I were higher ($P<0.05$) than scores for steaks from Dual-purpose carcasses. Ramsey and coworkers (1963) looked at the impact of type and breed on production, palatability and composition of cattle, finding no significant differences in shear force values, tenderness, juiciness or flavor in round or loin steaks of British and dairy breeds. However, steaks from Zebu cattle consistently received higher shear values, and lower tenderness, juiciness and flavor values as compared to the other two breeds.

Abney (2004) reported Holstein yearling steers (HY) had less ($P=0.03$) connective tissue and displayed more desirable ($P<0.01$) myofibrillar and overall tenderness when compared to beef cattle yearling steers (BY). In addition, as cattle were fed to higher fat thickness endpoints, myofibrillar tenderness increased ($P=0.03$). In agreement with taste panel data, Warner-Bratzler shear force values were lower ($P<0.01$) for HY versus BY, and Warner-Bratzler shear force values improved (lower; $P=0.03$) as fat thickness increased. In contrast, beef steers started as calves (BC) had less ($P<0.01$) connective tissue as determined by the taste panel, and showed improved ($P\leq0.05$) myofibrillar and overall tenderness when compared to Holstein calf-fed steers (HC). Amount of connective tissue increased ($P=0.02$) as fat thickness increased. Warner-Bratzler shear force data agree with taste panel evaluations for tenderness, showing lower ($P\leq0.01$) values for BC versus HC. The actual age of the steers is unknown, but the Holstein calf-feds were on feed an average of 312 d vs 172 d for BC. The impact of age differences between 12 and 24 months are not clearly defined in the literature. Additionally, HY were on feed an average of 170 d vs 116 d for BY. For yearlings, it appears that increased time on feed had no adverse effects on tenderness, however, there may be a threshold in terms of time on feed and the impacts on tenderness.

Composition

Composition is one of the most important carcass characteristics from both a physical and chemical viewpoint. Current pricing mechanisms value dairy-type cattle lower than typical beef-type cattle, because of lower dressing percent, inferior conformation and a lower percentage of valuable cuts from the rib and loin (Dikeman et al., 1977). It is often the theory that beef carcasses with ideal conformation should have a greater proportion of the major cuts (Cole et al., 1964; Dikeman et al., 1977). Berg and Butterfield (1968) serially harvested Holstein and Hereford cattle to compare growth patterns of bovine muscle, fat and bone. Their findings revealed that at any given age, Friesians had greater size, more muscle, more bone but essentially the same amount of fat as Herefords. Cole and coworkers (1964) compared carcasses of Angus, Hereford, Brahman, Brahman cross, Santa Gertrudis, Holstein and Jersey cattle. Findings from their study indicated that Angus carcasses had the lowest percent separable muscle, separable bone, moisture, protein, round, loin, chuck, and fore-shank. However, Angus had the highest percent separable fat, ether extract, flank and brisket. Holstein carcasses produced the highest percent separable muscle, separable bone, moisture, protein, round, and fore-shank. Additionally, Holsteins had the highest percent separable muscle in all wholesale cuts except the chuck and plate; and highest percent separable bone within all wholesale cuts except the flank. They were also the lowest of all breeds in percent separable fat in the carcass, ether extract content of the carcass, flank, and separable fat in all wholesale cuts but the chuck.

Contrary to these results, Branaman et al. (1962) found no significant difference in the percent rib, round and loin (high-priced cuts) for Holstein versus beef-type cattle. Additionally, the percent separable lean between the two groups were similar, indicating that both groups contained the same amount of muscle. Although beef-type cattle had a higher percent (approximately 2.3% more) separable fat, this difference was not significant, while Holstein cattle produced a significantly greater percentage ($P<0.05$) of separable bone. In a trial comparing dairy and beef carcasses, Judge and coworkers (1965) found the combined round, loin and rib expressed as a percent of carcass weight of steers the same age was higher for Holsteins than Angus (72.1% and 66.1%, $P<0.05$). However, when dairy carcasses were compared to beef carcasses of younger cattle, no difference was seen. Furthermore, after reviewing available literature, Pearson (1966) concluded that beef and dairy cattle finished under the same conditions differed little in retail cut-out. However, beef cattle tended to have a higher dressing percent, while also producing a greater amount of separable fat.

Dikeman and others (1977) conducted a trial using steer carcasses from three major British beef breeds (fifteen in each of two weight groups; light, 500 to 550 lb and heavy, 700 to 750 lb) and Holstein. The heavy British group had less bone ($P<0.01$) than the Holsteins, but more external and total fat ($P<0.01$). Weight of total retail cuts from the rib, loin, round and chuck (RLRC) or roasts and steaks in the RLRC were similar. However, Holstein carcasses had a higher ($P<0.05$) proportion of combined four primal wholesale cuts from the RLRC and a lower ($P<0.01$) proportion of flank than the heavy British group. Additionally, light British carcasses had a higher ($P<0.01$) percentage of retail cuts and RLRC roasts and steaks, less ($P<0.01$) bone and less ($P<0.01$) external fat trim from the RLRC than Holstein carcasses. The results from these studies are indicative of the role fat plays in dressing percent and yield of major untrimmed wholesale cuts among breeds. When assigning value to meat animals, the amount of lean is extremely important, however distribution of lean within wholesale cuts is equally important since large price differentials exist between beef wholesale primal cuts. In the

Garcia-de-Siles study (1977), Hereford cattle were significantly older ($P<0.01$) than Holstein steers at harvest, but had similar in chilled carcass weight. Consequently, based on days of age, chilled carcass weight, RLRC, edible portion, and trimmed loin plus round were greater ($P<0.01$) for Holsteins. In addition, Holstein carcasses had heavier ($P<0.01$) round and chuck weights and chuck weight expressed as a percentage of side weight. Untrimmed rib weight and percentage of side weight were greater ($P<0.01$) in Hereford carcasses than Holsteins. Untrimmed loins were heavier ($P<0.05$) in Herefords, but no difference was observed in trimmed loin percentage. Hereford cattle had greater longissimus muscle area ($P<0.01$), whereas, Holstein carcasses had higher percentage cutability ($P<0.01$). Thonney and others (1984) compared Holstein and Hereford steers harvested at five different weights. At the same carcass weight, Holstein steers had more ($P<0.05$) trimmed chuck, rib, loin and round primal cuts. Additionally, the percentage of primal cuts in relation to chilled side weight, declined at a decreasing rate with increasing carcass side weight from 220-440 lb.

In summary, when compared at common age or weight endpoints, Holstein carcasses have a higher percentage of muscle and bone, while British breed carcasses have a higher percentage of fat.

Industry Closeout Summary

Closeout information from the VetLife Benchmark Performance Program provided by Dr. Pete Anderson will be used to compare performance from Holstein and beef steers started on feed at various weights (Table 3). The Holstein records are from 1.4 million head and the beef records include 20.5 million head. Holstein steers are on feed longer regardless of the starting weight on feed. DM consumption across breeds and weight classes was amazingly similar at approximately 2% of the average body weight for the feeding period. This observation is very different from the research literature summary where Holsteins consumed 4.7 % more DM per day. This difference suggests the environmental conditions and diets between university and commercial feedlots may be dissimilar. Holstein and beef steers started on feed at weights between 300 and 500 lb had similar weight gains but at heavier starting weights the beef steers had a marked advantage. Part of the explanation for the difference in weight gain may be explained by heavier out weights and longer feeding periods for Holsteins than beef steers at heavier starting weights.

Feed conversion efficiency was similar for Holstein and beef steers started on feed at 300 lb but as starting weights increased, beef steers become progressively more efficient compared to Holstein steers. The ranges in feed conversion efficiency from 300 -900 lb starting weights for Holsteins and beef steers were 6-9.4 and 5.9-6.93, respectively. Cost of gain was similar across starting weights for beef steers but quite variable for Holsteins. Cost of gain progressively increased as starting weight increased for Holstein steers. Poor feed efficiency and greater yardage costs due to longer stays in the feedlot would explain a large portion of the higher costs of gain. Health costs tended to be similar although light-weight beef calves had slightly higher costs than Holsteins of similar initial weights. Death loss was similar for Holstein and beef steers.

Carcass weights were similar between Holstein and beef steers and increased as starting weight increased. Dressing percent was significantly less for Holstein steers as compared to beef steers. It did trend downward slightly as starting weight increased. The differences in DP between Holstein and beef steers reported in the university research trials and the closeout database are in close agreement. Holstein steers had a greater proportion of carcasses grading USDA prime and choice at each starting weight category as compared to beef steers. Additionally, the proportion of Holstein steers grading USDA choice or prime increased as starting weight and days on feed increased whereas, the proportions of USDA prime and choice at each starting weight were similar for beef steers. Another interpretation would suggest at the desired carcass weights, Holstein steers grade better than beef steers.

The cost of gain favors beef steers except at starting weights of 300 lb or less and carcass quality favors Holstein steers. Clearly the balance between production cost and carcass value determines profitability. It appears that Holstein steers started at 300 lb or less can be very competitive with beef steers. Holsteins started at heavier weights would have to be purchased at a discount to similar weight beef steers to generate the same profitability. In the studies reported by Abney (2004), the breakeven feeder purchase price was $114.17, $106.02, $70.33, and $74.37 per cwt for 380 lb Holstein steers, 566 lb beef steers, 960 lb Holstein yearling steers, and 974 lb beef yearling steers, respectively (Table 4). The breakeven purchase price was the sum of calculations based on closeout values from a ten-year price series for corn, soybeans, interest rates and carcass cutout values for primals and subprimals.

Comparisons of performance and carcass characteristics of Holstein steers started on feed at 300 and 600 lb in three regions of the U.S. are shown in Table 5. The cost of gain among the three regions is similar for Holstein steers started at 300 lb. At heavier starting weights, the Midwest tends to have an advantage. The Midwest feedlots remain competitive even though cattle are fed longer and performance is poorer because ration costs are cheaper. Each region appears to have strengths for feeding Holsteins but a clear advantage for one region over another does not exist.

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Table 1. Thirteen trial summary of performance from Holstein and beef steers

	Breed	# Ani/ trt		Initial weight, lb		Final weight, lb		ADG, lb		DMI, lb/d		Feed/gain		DMI, % of BW	
Author	Comparison	Holstein	Beef	Holstein	Beef	Holstein	Beef	Holstein	Beef	Holstein	Beef	Holstein	Beef	Holstein	Beef
Kitwell & McCormick, 1956	H vs HF	7	7	765	761	1018	1090	2.34	1.66	26.5	22.2	11.3	13.4	2.97	2.40
Garrett, 1971	H vs HF	32	32	455	407	906	866	2.52	2.56	17.6	16.2	7.1	6.3	2.59	2.55
Garrett, 1971	H vs HF	8	8	508	540	862	906	2.53	2.62	21.1	20.2	8.3	7.8	3.08	2.79
Windels etal.,1972	H vs HF*AN	40	40	596	640	1075	1071	2.7	2.97	22.2	21.4	8.3	7.4	2.66	2.50
Smith etal.,1973	H vs HF*AN	159	177	574	531	1148	1030	2.88	2.8	18.9	16.9	6.6	6	2.20	2.17
Martin & Wilson,1974	H vs HF	7	5			867	843	2.2	2.11						
Smith etal.,1974	H vs HF*AN	177	182	402	420	1082	1033	2.41	2.46	15.3	14.7	6.3	6	2.06	2.02
Garcia-de-Siles etal.,1977	H vs HF	15	11			955	931	2.44	1.98			5.4	7.3		
Thonney,1981	H vs AN	74	72	700	898			2.09	2	18.6	16.1	9.4	8.4		
Thonney,1987	H vs HF,AN	32	62					2.31	2.09	18.9	18.3	8.3	8.9		
Perry etal., 1991	H vs AN & AN*Sim	24	48	574	637	1151	1124	2.66	3.47	17.9	19.1	6.8	5.5	2.08	2.17
Abney, 2004	H vs AN	70	70	380	566	1343	1269	3.09	4.11	17.3	18.8	6.1	5.3	2.01	2.05
Abney, 2004	H vs AN	90	110	960	974	1501	1354	3.69	3.29	26.4	24.6	8.2	7.5	2.15	2.11
	Average			591.4	637.4	1082.5	1047.0	2.60	2.62	20.1	19.0	7.7	7.5	2.40	2.31
	# of trials				7/10		9/11		6/13		9/11		10/12		7/9
	Difference, %				-7.78		3.28		-0.77		5.53		2.50		3.78
	Weighted averages			570.9	617.5	1172.0	1104.0	2.72	2.79	19.0	18.1	7.2	6.7	2.20	2.15
	Probability				0.61		0.34		0.77		0.55		0.37		0.67
	Difference, %				-8.16		5.80		-2.57		4.74		6.67		2.27

[a] H= Holstein; HF= Hereford; AN= Angus; SIMM= Simmental

Table 2. Eleven trial comparison of dressing percent between Holstein and beef steers.

			# animals/trt		Days on feed		Hot carcass wt, lb		Dressing percent	
Author	Location	Breed Comparison[a]	Holstein	Beef	Holstein	Beef	Holstein	Beef	Holstein	Beef
Garrett, 1971	CA	H vs HF	8	8	140	140	584	616	58.2	59.5
Garrett, 1971	CA	H vs HF	16	16	178	178	587	611	62	63.2
Windels etal., 1971	MN	H vs HF	40	40	180	148	634	631		
Smith etal. 1973	MN	H vs HF*AN	159	177	199	178	680	663		
Martin & Wilson, 1974	PA	H vs HF	7	5						
Smith etal., 1974	MN	H vs HF*AN	177	182	282	248	650	672		
Garcia de Siles etal., 1977	PA	H vs HF	15	11	122	206	552	602	60.3	63.8
Knapp etal.,1989	TX	H vs English & exotic	15	30			702	724	61.5	64.1
Perry etal.,1991	NY	H vs AN & AN*SIMM	24	48	218	141	708	696		
Abney, 2004	MI	H vs AN	70	70	312	172	754	754	58.4	61.7
Abney, 2004	MI	H vs AN	90	110	170	116	844	796	58.7	61.3
		Average			200	170	669.5	676.5	59.9	62.3
		# of trials				6/8		4/8		7/7
		Difference, %				15.21		-1.05		-4.04
		Weighted averages			228.6	181.8	695.7	696.1	59.1	61.9
		Probability				0.08		0.99		0.003
		Difference, %				20.47		-0.06		-4.74

[a]H=Holstein; HF=Hereford; AN=Angus; Simm=Simmental

Table 3. Eleven trial summary of carcass characteristics of Holstein and beef steers.

			Backfat, in.		Ribeye area, in^2		KPH, %		Yield grade		Marbling[b]	
Author	**Location**	**Breed Comparison[a]**	**Holstein**	**Beef**	**Holstein**	**Beef**	**Holstein**	**Beef**	**Holstein**	**Beef**	**Holstein**	**Beef**
Garrett, 1971	CA	H vs HF									450	500
Garrett, 1971	CA	H vs HF									450	500
Windels etal., 1971	MN	H vs HF	0.18	0.58	10.5	11.2	2	3.1	2.40	3.38	468	549
Smith etal. 1973	MN	H vs HF*AN	0.2	0.68	10.5	12.1	3	3.1	2.82	3.47	523	481
Martin & Wilson, 1974	PA	H vs HF	0.25	0.77	8.9	9.9						
Smith etal., 1974	MN	H vs HF*AN	0.28	0.92	10.5	11.3	2.7	3.3	2.85	4.40	442	503
Garcia de Siles etal., 1977	PA	H vs HF	0.3	0.79	9.3	10.7	3.9	3.4	3.15	4.02	455	755
Knapp etal.,1989	TX	H vs English & exotic	0.21	0.52	11.3	12.5	1.9	1.8	2.46	2.91	485	452
Perry etal.,1991	NY	H vs AN & AN*SIMM	0.27	0.41	11.2	12.1			2.28	2.30	525	547
Abney,2004	MI	H vs AN	0.31	0.58	11.3	12.8	4.2	3	3.36	3.32	593	590
Abney,2004	MI	H vs AN	0.31	0.48	11.9	13	4	3.4	3.47	3.24	635	570
		Average	0.26	0.64	10.6	11.7	3.1	3.0	2.9	3.4	502.6	544.7
		# of trials		9/9		9/9		4/7		6/8		6/10
		Difference, %		-148.1		-10.7		2.8		-18.6		-8.4
		Weighted averages	0.26	0.67	10.8	12.0	3.1	3.1	3.0	3.7	515.1	524.2
		Probability		0.0001		0.002		0.99		0.01		0.75
		Difference, %		-157.7		-11.1		0.0		-23.6		-1.8

[a] H= Holstein; HF= Hereford; AN= Angus; SIMM= Simmental

Table 4. Feedlot closeout for Holsteins versus beef steers from Vetlife Benchmark Performance Program

Sex	In wt 100	Head	In wt, lb	Out wt, lb	DOF	DMI, lb/d	ADG, lb	F/G	Cost of gain, $/lb	Vet, $/hd	Death, %	HCW, lb	Dress, %	Prime, %	Choice, %
Holsteins	300	425,576	327	1,258	347	15.82	2.65	6	0.54	16.74	3.59	777	61.8	1.8	47.7
Holsteins	400	97,667	451	1,289	302	17.76	2.73	6.55	0.57	14.83	3.58	784	61.6	2.3	50.7
Holsteins	500	49,332	545	1,288	263	18.71	2.80	6.73	0.57	13.84	2.32	792	61.7	2.9	57.2
Holsteins	600	60,930	653	1,298	222	19.92	2.86	7.04	0.59	12.42	2.08	795	61.5	2.8	57.7
Holsteins	700	72,469	749	1,322	190	21.02	2.99	7.13	0.6	11.45	1.69	799	61.2	2.9	57.3
Holsteins	800	80,813	846	1,313	154	22.7	2.99	7.77	0.6	9.65	1.13	806	60.7	3.9	56.5
Holsteins	900	66,616	940	1,403	181	23.59	2.59	9.4	0.65	8.07	1.17	820	60.7	5.0	60.3

Sex	In wt 100	Head	In wt, lb	Out wt, lb	DOF	DMI, lb/d	ADG, lb	F/G	Cost of gain, $/lb	Vet, $/hd	Death, %	HCW, lb	Dress, %	Prime, %	Choice, %
Steers	300	188,922	364	1,115	298	14.6	2.47	5.93	0.53	21.51	4.16	729.7	64.6	1.2	47.3
Steers	400	711,714	460	1,138	255	15.7	2.61	6.06	0.53	22.11	3.39	740.2	64.5	1.0	43.9
Steers	500	2,119,892	558	1,181	216	17.3	2.83	6.19	0.53	19.54	2.61	761.8	64.3	0.9	46.1
Steers	600	4,363,876	653	1,224	185	18.8	3.03	6.26	0.53	15.96	1.78	786.0	64.1	0.8	45.1
Steers	700	6,224,588	751	1,263	156	20.3	3.23	6.34	0.53	11.37	1.08	808.7	64.0	0.7	44.2
Steers	800	5,442,413	843	1,303	135	21.8	3.36	6.55	0.53	9.20	0.73	826.3	63.8	0.6	42.5
Steers	900	1,473,795	935	1,350	120	23.3	3.43	6.93	0.54	8.91	0.63	842.7	63.4	0.7	42.3

Table 5. Comparison closeouts from steers fed in different region of the U.S.

	----------300 lb----------			----------600 lb----------			----------800 lb----------	
	CA & AZ	KS,TX,OK	IA,NE.SD,MN	CA & AZ	KS,TX,OK	IA,NE.SD,MN	KS,TX,OK	IA,NE.SD,MN
# Animals	284,046	89,184	14,063	14,972	37,898	5,655	28,074	9,217
Initial weight, lb	318	336	347	640	656	647	838	853
Final weight, lb	1,235	1,295	1,371	1,234	1,303	1,301	1,332	1,342
Days on feed	341	351	403	229	218	245	156	166
DMI, lb/d	15.12	16.89	16.39	17.53	20.03	20.32	22.44	23.3
ADG, lb	2.67	2.68	2.51	2.62	2.93	2.61	3.14	2.91
Feed/gain	5.69	6.32	6.55	6.81	6.9	7.89	7.32	8.12
Cost of gain, $/lb	0.54	0.55	0.55	0.63	0.58	0.6	0.62	0.59
Vet/Med, $/hd	15.89	18.14	17.09	5.56	13.06	13.49	11.26	10.61
Death loss, %	2.68	4.95	3.23	1.71	1.95	3.45	1.33	0.95