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NebGuide

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Feeding and Managing Holstein Steers

This NebGuide discusses feeding and management practices to maximize feedlot performance, carcass quality, and profitability of Holstein steers.

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- Holstein Steers vs Conventional Breeds
- Profitability Potential of Holstein Steers
- Final Market Weight
- Other Management Consideration
- Conclusions

Holstein Steers vs Conventional Breeds

Holstein steers usually are placed in the feedlot either as light-weight (250 to 350 pounds) calves or as feeders (600 to 800 pounds). The growth of Holstein feeder steers is generally more consistent than for conventional beef breeds. Typical performance levels for Holstein feeder steers are:

1. daily gain (live weight basis) -- about 3 pounds per head,
2. feed intake -- about 18 to 20 pounds daily, and
3. feed conversion -- about 6 to 7 up to 1,000 pounds.

Above 1,000 pounds of live weight, feed conversion for Holstein steers is much higher (less efficient). Dressing percentage is generally 6 to 8 percent lower for Holsteins compared with beef breeds. At a constant weight, Holstein steer carcasses have less backfat, marbling, and total fat, with more protein and bone compared with beef breeds. Meat from Holstein steers compares favorably to that from other breeds. Recent Cornell University research compared boneless ribeye steaks from Holstein and Simmental x Angus steers. The steaks could not be distinguished visually, and palatability was equal between the breeds.

Profitability Potential of Holstein Steers

Holstein steers may grow faster than beef breeds when gain is expressed on a liveweight basis. However, adjusting for differences in dressing percentage results in Holsteins gaining similarly, but less

efficiently, than beef breeds. In general, Holsteins have a greater mature weight and frame size than conventional beef breeds. Consequently, the composition of gain at similar weights will show more fat and less lean for beef breeds compared with larger-framed Holsteins. Additionally, maintenance energy requirements are 12 percent higher for Holsteins compared with beef breeds.

Producing more lean by Holstein steers ought to be economically advantageous considering current negative consumer attitudes toward high-fat foods. Holstein steers reach the beef industry standard of Choice quality grade at acceptable carcass weights and produce leaner carcasses with as much, or sometimes more, boneless retail yield at 1/8- to 1/4-inch fat trim compared with conventional beef breeds. However, the lower dressing percentage for Holstein steers is probably the single most important factor contributing to lower market value of Holstein steers. Traditional biases in cattle marketing also account for some of the discount for Holstein carcasses.

The primary advantage Holstein steers have over traditional beef breeds is their uniform performance. The Holstein breed has been selected primarily for high milk production. This selection has resulted in a relatively narrow genetic base compared to the beef industry. The narrow genetic base results in Holstein steers having a more consistent and predictable feed intake and daily gain throughout the feeding period that makes for easier nutritional management. Often, Holstein steers require less medication during the receiving period because they are not going through the stress of being weaned.

Table I. Rations and expected performance for Holstein steers fed from 150 to 700 pounds.

	Stage 1 (150-450 lb.)			*Stage 2 (450-700 lb.)*		
Item[a]	*Two Phase*	*High Grain*	*All Grain*	*Two Phase*	*High Grain*	*All Grain*
Alfalfa hay	20.0	10.0	---	---	---	---
Corn silage	40.0	10.0	---	89.1	30.0	---
Cracked or whole corn	26.6	66.6	84.4	---	61.6	91.8
Supplement	13.4[b]	13.4[b]	15.6[c]	10.9[b]	8.4[c]	8.2[d]
Nutrient composition						
Net energy for gain, Mcal/cwt	51.0	61.9	67.8	47.4	61.7	68.1
Crude protein, %	15.0	15.0	15.0	12.0	12.0	12.0
Calcium, %	.75	.75	.75	.45	.50	.70
Phosphorus, %	.35	.35	.35	.35	.35	.35
Potassium, %	.70	.70	.70	.60	.60	.60
Estimated DM intake, lb	9.0	9.0	8.0	16.1	16.1	15.0
Estimated daily gain, lb	1.8	2.4	2.4	2.0	3.0	3.0
Days required	165	125	125	125	85	85

[a]Percent dry matter basis.
[b]40% protein supplement as is basis.
[c]38% protein supplement as is basis.
[d]32% protein supplement as is basis.

These advantages may be reduced during severe wet, cold, or muddy conditions. Holsteins are less tolerant of cold and muddy conditions compared with most beef breeds. Holsteins tend to have shorter hair, thinner hides and less body condition than beef animals, thus the effect of cold stress is greater for Holstein steers. Extreme cold stress is not well tolerated. Windbreaks or shelters should be provided in the winter. Under severe cold stress conditions, bedding may reduce the effect of cold on health and performance. If bedding is used, it should contain a high dry matter content, such as straw, sawdust or shredded newspapers. Bedding use may be more practical for smaller feedlots. Keep in mind, however, that environmental stress will be an important consideration for any Nebraska producer wishing to raise Holstein steers.

Table II. Rations and expected performance for Holstein steers fed from 700 to 1,100 pounds.

	Stage 3 (700-1100 lb.)			*Total (Stages 1 to 3)*		
Item[a]	*Two phase*	*High Phase*	*All Grain*	*Two phase*	*High grain*	*All Grain*
				----------pounds[b] ----------		
Alfalfa hay	---	---	---	330	130	---
Corn silage	15.0	15.0	---	8140	2850	---
Cracked or whole corn	78.3	78.3	94.2	3120	4520	5290
Supplement	6.7[c]	6.7[c]	5.8[c]	690	530	480
Nutrient composition						
Net energy for gain, Mcal/cwt	64.1	64.1	67.6			
Crude protein, %	12.0	12.0	12.0			
Calcium, %	.70	.70	.70			
Phosphorus, %	.30	.30	.30			
Potassium, %	.60	.60	.60			
Estimated DM intake, lb	25.7	23.4	21.6	16.1	16.4	15.0
Estimated daily gain, lb	3.3	3.0	3.0	2.3	2.8	2.8
Days required	120	135	135	410	345	345

[a]Percent dry matter basis.
[b]As-fed pounds per head.
[c]40% protein supplement as is basis.

Feeding Programs for Holstein Steers

Be certain to purchase only healthy calves. Top-quality Holstein bull calves will weigh about 90 to 115 pounds, with no evidence of disease such as scouring. Look closely at the feet and legs of any purchased calves and check for good mobility and absence of lameness. Whenever possible, purchase calves only from suppliers that will have fed colostrum to the bull calf within the first 6 to 10 hours of life. For more information about managing Holstein calves prior to 150 pounds, use the management guidelines outlined in NCR #205, *"Raising Dairy Replacements"*, available through your local extension office.

After a Holstein steer calf reaches approximately 150 pounds, most feeding programs for finishing steers will be one of three types:

1. continuous high or all-grain feeding,
2. two phase (pasture or forage phase followed by finishing phase), and
3. continuous high levels of corn silage.

Example rations and expected performance for each system are summarized in *Tables I* and *II*. Generally, handling and feedbunk habits of Holstein steers are similar to conventional beef breeds. However, Holstein steers tend to be more docile than beef cattle. Mixing beef and Holstein steers may create social problems. To reduce social stress, dominant animals may need to be removed. In addition, bunk and waterer space requirements may be more critical for animals such as Holsteins which have been raised under conditions that are much different than most beef breeds.

- ***Continuous High or All Grain Feeding***

  Advantages of this feeding system include:
  1. smaller amounts of feed and manure to handle,
  2. usually less labor and equipment needed, and
  3. less time required to reach slaughter weight and proper carcass condition.

  If a producer also raises large amounts of grain, it may be profitable to market the grain through the cattle. This feeding system usually will be the most profitable especially when labor, roughage availability, and handling is a problem; when cost of silage harvesting and storage is high; or when high cattle turnover rates are needed. When fed high corn diets, Holstein steers usually will grade Choice at 1,050 to 1,200 pounds.

  Some feedlots prefer to feed light-weight (250 to 350 pounds) Holstein calves. These calves, also called "pee-wee" Holsteins, are fed high-grain finishing diets for approximately 400 days. Pee-wee calves require increased attention to their nutritional and health needs, especially early in the feeding period. The nutritional needs of the calf are at their highest level and the calf's immune system is still susceptible to invasion from viruses and bacteria. Death loss is higher (3 to 5 percent of total head) with light-weight Holstein calves compared with older, Holstein feeder steers. The higher death loss may be due to several conditions: increased susceptibility to respiratory diseases, increased digestive deaths due to long-term feeding of high concentrate diets, or simply due to the length of time (400 days) the calves are fed in the feedlot. Feeding light-weight Holstein calves has generally been economically feasible in feedlots in the southern High Plains, southwest U.S. and California due to the warmer, drier feeding climate.

- ***Two Phase Feeding Systems***

  Two phase feeding systems have been common in the Midwest. Usually, steer calves are fed one percent of bodyweight in grain and full-fed hay, corn silage, or pasture up to approximately 700 pounds. From 700 pounds to slaughter weight (1,000 to 1,300 pounds), steers are fed free choice shelled corn and a protein supplement to balance the ration. They may also be offered two to five pounds of hay or silage per head daily. Research comparing a two phase feeding system with a high grain finishing system for Holsteins is limited. Nebraska beef research shows calves fed in a high grain finishing system are more efficient, have a lower cost/gain, and will reach finishing weights in a fewer number of days than calves grown on silage followed by a short grain finishing period. However, Cornell University research showed that Holstein steers fed using a two phase

system (alfalfa silage at 40 percent of dry matter intake up to 850 pounds followed by a 90 percent concentrate diet to slaughter) reached finishing weights in the same number of days as steers fed a 90 percent concentrate diet continuously with no effect on carcass grade. Until more data are collected with Holsteins, producers should base feeding decisions on the relative energy price of corn versus roughage and their ability to safely feed high grain finishing diets.

- ***Continuous High Corn Silage Feeding***

  This program is similar to the first phase of a two phase system in that free choice corn silage is fed, with appropriate protein supplements, to slaughter weight. This feeding system allows producers to maximize silage use but increases the amount of feed required per unit of gain, increases the time necessary to attain slaughter weight resulting in increased yardage and interest costs, and consequently increases cost/gain.

  Generally, the profitability of a forage-based feeding system depends on:
  1. cost of feed harvest and storage (including storage losses, especially for silages),
  2. increased fertilization costs and potential for erosion,
  3. costs associated with time on feed, such as yardage (includes labor and management salaries, facility costs, equipment costs, and other non-feed costs), and,
  4. proper use of implants to promote efficient growth.

Final Market Weight

What is the final market weight which offers the greatest profit potential for Holstein steers? To answer this question for a given situation consider:

1. yardage costs,
2. costs associated with extra days on feed,
3. feed and forage costs,
4. potential death losses,
5. market price of Choice versus Select cattle, and
6. origin and previous feeding management and care of cattle that are being fed out.

A producer must carefully compare the total input costs associated with slaughter at a certain weight to the potential returns. Clearly, the feeding system used will have a large effect on the most profitable slaughter weight. In some cases, steers fed to higher weights (even above 1,100 pounds) may be more profitable. However, there is usually a dramatic decrease in daily gain and feed efficiency for Holstein steers weighing greater than 1,100 to 1,150 pounds. As long as cost/gain is less than $/cwt sale price, it is profitable to continue feeding.

The slaughter market for Holsteins is not as stable and predictable as the market for conventional beef breeds. Some slaughter facilities only purchase Holsteins periodically. Feedlots should strongly consider forward contracting Holsteins during the feeding period and not wait until the cattle are finished. Trying to find interested buyers when the cattle are ready for slaughter may result in delays selling the cattle and unnecessary increases in cost/gain.

Other Management Considerations

- *Handling During Receiving Period*. Due to the lack of readily available supplies, procuring Holstein steers presents unique problems to the cattle feeder. Commingling of newly purchased

calves with previous arrivals should be avoided. Grouping and starting calves within a specified time period is recommended. Sorting cattle by size or body condition can be done once cattle have adapted to feed and facilities. Health-related problems from receiving and commingling are greater with smaller, younger calves and decrease as calves approach yearling age. Because health of purchased calves is typically compromised due to handling and transporting, producers must be ready to deal with significant health problems, particularly if calves are only a few weeks old. At receiving, even acceptable bull calves may need electrolytes, antibiotics, and appropriate booster vaccinations for common respiratory diseases. Consult with your veterinarian as appropriate. Electrolytes may be added to the water source, and antibiotics in the receiving diet if needed. Death losses between 2 and 5 percent can easily occur with young calves. Death losses will be less if older, 300- to 400-pound calves are purchased instead of young baby calves. Experience in Nebraska indicates that under comparable feeding conditions and weight ranges, death loss will range between 1 and 2 percent for Holstein yearling steers; approximately twice that found for beef steers. With appropriate management and ideal weather conditions, however, death losses can be minimal.

- *Supplementation*. Use mostly natural sources of protein to 450 pounds. From 450 to 700 pounds, one-half of crude protein can come from urea. Beyond 700 pounds, all crude protein can come from urea or ammoniated silage. The supplement should also contain vitamins, trace minerals and salt.

- *Avoid Digestive Problems*. Acidosis is the most important digestive problem when feeding grain diets to cattle. Acidosis occurs when cattle consume too much grain in a short period of time. Acidosis is not one problem, but a continuum. Effects of acidosis can be as slight as a .25 pound/day reduction in feed intake, or as severe as the death of an animal. Several additional acidosis-related problems are liver abscesses, founder, polioencephalomalacia ("brainers"), rumenitis and malabsorption. For a complete discussion on digestive problems consult the NebGuide *"Acidosis"*, G91-1047.

  Subacute acidosis is the less severe form of acidosis which results in reduced feed intake accompanied by reduced daily gain. Erratic intake patterns may be another indication of subacute acidosis. Never allow cattle to run out of feed after they have attained a full feed of the finishing ration, especially when using the all-concentrate feeding program. Ionophores, such as Rumensin®, can be fed to reduce variation in feed consumption, and in addition, will increase efficiency of digestion in the rumen. Feedlots have observed fewer digestive deaths when Rumensin was fed at 25 to 30 grams/ton of ration.

  Liver abscesses are common when high grain rations are fed. Feeding a low level of antibiotics like tetracycline or tylosin will reduce the incidence and severity of liver abscesses. Providing 1 to 2 pounds of hay or 5 to 10 pounds of corn silage per head daily (as-fed basis) will also reduce the incidence of acidosis and subsequent liver abscesses.

- *Use of Implants*. Holstein steers should be reimplanted approximately every 100 days with an implant such as Ralgro, Implus-S, or Synovex-S or 200 days with Compudose. Reimplanting is important for maintaining feed intake and daily gain for feedlot cattle. Revalor may be used on heavier cattle, but the goal should be to use the last Revalor implant no later than 70 to 100 days from the expected slaughter date. Most implants successfully improve daily gains and feed efficiency, but may decrease slightly the number of cattle grading Choice.

- *Housing and Environment*. Any environmental stress can reduce daily gains and feed efficiency of Holstein steers. Field observations would show that Holstein steers are more susceptible to severe

weather conditions and muddy lots than beef breeds. During cold, wet, and windy weather or during extremely hot and humid weather, some type of protection is preferred for Holstein steers raised in the Midwest. Any housing facility should be kept dry and draft-free. Often, ridge ventilation allows the best escape of humid, moist air from the building. Minnesota research compared the performance of Holstein steers housed in either manure scrape pens or in cold, slatted floor pens. These researchers found higher feed intakes and daily gains, but similar feed efficiencies, for slatted floor pens. Housing type had no effect on carcass characteristics of the steers at slaughter. Some producers find that Holsteins are more awkward on concrete floors than are beef breeds, and avoid housing larger Holstein steers on concrete slatted floors due to increased incidence of swollen hocks and sore legs.

Conclusions

Feeding Holstein steers can be profitable, if they are properly managed. Successfully raising Holstein steers requires a different management style recognizing the genetic and functional differences between Holsteins and traditional beef breeds. The greater dependability and uniformity of performance compared with beef breeds may make Holstein steers a viable option for some beef producers as well as dairy producers who raise their own dairy beef.

To simplify technical terminology, trade names or equipment sometimes are used. No endorsement of product is intended nor is criticism implied of products not mentioned.

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