

Animal Welfare And Herd Health Standard Operating Procedures Case Study Reports



CENTER FOR
DairyEXCELLENCE



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As a part of the Animal Welfare and Herd Health Standard Operating Procedures grant, The Center for Dairy Excellence utilized farm press and other media avenues to encourage Pennsylvania dairy farmers to apply for a \$1,000 grant that would help them to address a dairy cow care area for improvement on their farm. The end result of this project would provide case studies for the entire industry to reference in pursuing optimal dairy animal care and welfare.

There were 13 applications received from dairy farms throughout Pennsylvania. After careful consideration by the Center staff along with the Penn State Extension Veterinarian team, nine farms with the most pertinent dairy animal care enhancement opportunities were selected to create “Herd Health and Cow Care (HHCC)” teams. The participating farms were notified that they had been selected as an HHCC team with further details of the project that would accompany after herd veterinarians were formally contacted to discuss the project. The herds, farm locations and herd veterinarians are provided in the table below:

Communication with the individual herd veterinarians was completed through a series of conference calls to convey the overall objectives and the expected involvement of both the farm and the herd veterinarian in the project. All calls to herd veterinarians included a Center for Dairy Excellence staff member and the PSU Extension Veterinarian team. These calls were all completed prior to January 1, 2012.

On February 1, 2012, each farm and veterinarian received a packet of information further outlining the objectives, goals and expectations. Within this packet of information, four standard forms were developed for farm owners and managers to complete throughout the extent of the grant (Appendix 1). Forms A and B were to be completed during the initial herd visit. The on farm evaluation team included the farm owner or manager, the herd veterinarian and a PSU Extension Veterinarian. These two forms outline the identified bottleneck, dairy animal care areas to address and the Standard Operating Procedures

Farm	County	Herd Veterinarian	Animal Welfare Focus
Neil Baxter	Erie	Dr. Christy Rynd	Milk Quality
Art and Betsy Cole	Susquehanna	Dr. Mike Kowalewski	Calf Health
Rick and Dana Empet	Susquehanna	Dr. Mike Kowalewski	Transition Cow Health
Jimmy Harris	Bucks	Dr. Dale Streams	Transition Cow Health
Tom Herr	Lebanon	Dr. Gary Brummel	Cow Comfort
Thomas Mellott	Franklin	Cory Meyers	Culled Cows/Locomotion
Ralph Moyer	Berks	Dr. Teri Coon	Milk Quality
Daniel Smith	Lebanon	Dr. Bruce Keck	Locomotion
Dale Weiler	Lancaster	Dr. Gary VanDyke	Locomotion

(SOPs) the farm and herd veterinarian will implement on the farm in the future to address the bottleneck.

By April 30, 2012, all initial herd visits were completed and SOP development forms were completed and submitted. Upon receipt of these forms, the Center for Dairy Excellence staff compiled the information and begun to develop case study formats for each farm. The SOPs developed from these visits are those that can be referenced by the greater industry from this project. During the initial farm visits, the group identified the bottleneck, and then further determined the three key more specific areas of focus. From these areas, the unit of professionals then developed a list of SOPs and the steps needed to complete each individual SOP.

Throughout the remainder of 2012, the herd veterinarians monitored progress of the SOPs and the farm provided measurable progress and outcomes. Participating farms and herd veterinarians provided a full synopsis of procedures implemented, measurable indicators of improvement in the area of animal welfare, along with any costs associated with addressing the area of animal welfare.

Within these case studies are the SOPs developed for each of the nine participating farms in relation to their animal welfare bottleneck.

In conclusion, these farms have improved animal care and subsequent welfare in their operations by creating and implementing these SOPs. These nine farms will now serve as case studies

for the Pennsylvania dairy industry to study and replicate. Improving dairy animal care and welfare will support the ongoing goals of optimal animal care and stewardship already in place within the industry. Improving cow comfort and animal health is an area on the farm where hidden profits can be realized. Therefore, the improved profitability of these farms will allow them to be sustainable over time. Secondly, improved on farm animal welfare will help to further demonstrate the commitment of the Pennsylvania dairy industry to consumer groups largely unfamiliar with modern practices on dairy farms. This cow care and herd health case study project has and will continue to help dairy farmers to make necessary improvements regarding herd health and cow comfort in order to remain a part of a long term viable industry.



Bottleneck: After aggressive culling and treatment of cows, herd still experienced high Somatic Cell Counts throughout the herd.

Goal: Have a consistent Somatic Cell Count (SCC) of 175,000 – 200,000 in entire herd.

Standard Operating Procedures (SOPs) that will address the Cow Care and Herd Health Bottleneck:

1. Milking procedure
 - a. Increase prep time from 60 to 90 seconds before milker is applied
 - b. Observe milk filter cleanliness
 - c. Use cloth towels for wiping teats (during preparation) instead of paper towels
2. Monitoring udder health
 - a. Teat end scoring – record lactation number and stage of lactation
 - b. Pre strip protocol – if there are chunks/flakes present, take a sample
 - i. If milk appearance begins to improve
 1. Assess further with the use of the California Mastitis Test (CMT) and record the SCC
 - ii. If milk appearance does not improve
 1. Culture a milk sample
 2. Follow with veterinarian recommended treatment
 3. Follow up treatment with a CMT test and SCC count
 - c. Utilize a lactometer to monitor milk let down rates
3. Monitoring Somatic Cell Count
 - a. Test the SCC count on all fresh cows, and perform a CMT test so to better identify the cows for culture and treatment
 - b. Implement CMT protocol to all cows at their dry off point and monitor dry period cure rates after freshening
 - c. If 3 cultures are negative, that determines the infection cure rate



SOP Implementation Impact Summary:

1. Experienced tremendous improvement
 - a. Implemented strict culling of high cell count cows based on DHIA (5-6 high animals culled)
 - b. Cows identified by DHIA for high cell counts, cultured
2. Milking practices changed
 - a. Allowed more ample time for pre-dip to be on contact and provided longer time for milk let down
 - b. Still using paper towels but other changes have allowed for reduced cell counts to be realized
3. Restarted dry off mastitis detection protocol
 - a. CMT testing at dry off
 - b. Dry cow treatment at dry off
 - c. Use DHIA to see what 1st SCC results are to identify if infections possibly occurring during dry period or early in lactation
4. Achieved quality premiums that were not getting before
5. CMT and culturing used regularly now
 - a. Environmental strep was the main pathogen identified
6. Currently working with the county to fix pathways so animals avoid muddy areas



Art and Betsy Cole

Bottleneck: Weaned calves experience reduced growth rates and general health status when taken from hutches and moved to group housing.

Goal: Reduce morbidity/mortality of grouped calves.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Monitor number of animals in group housing
 - a. Do not allow more than 15 calves per group
 - b. Keep notes on calendar when calves are moved
 - c. Monitor growth (height) parameters in group
2. Move 6 calves into larger, super-hutch after moved from individual hutches
 - a. Allow super-hutch to be “transition” between individual/group housing
 - b. Keep similar-aged calves in a group
3. Monitor total number of heifers on farm
 - a. Take monthly inventory of all heifers
 - b. Evaluate whether to sell or keep heifers
4. Improve ventilation in group barn
 - a. Add windows in the back of the barn
 - b. Make replaceable shutters



SOP Implementation Impact Summary:

1. Heifers have done really well
 - a. Added a super hutch in February of 2012 with no more than 6-8 calves in the hutch
 - b. Calves do not take steps backwards like they used to
 - c. Growthier calves and generally, calves are doing better throughout all stages of their lives
2. High number of calves dictated needing to monitor calves per pen more closely
 - a. Super hutch allowed for a graduation step allowing for easier transition
3. Mortality and morbidity has improved
 - a. No calves lost
 - b. Limited purchase and use of antibiotics as compared to past years
 - c. Even with the wet fall, no pneumonia cases to date
4. Careful not to exceed 8 calves per super hutch otherwise benefits diminish
5. Make a more conscious effort to keep calves dry

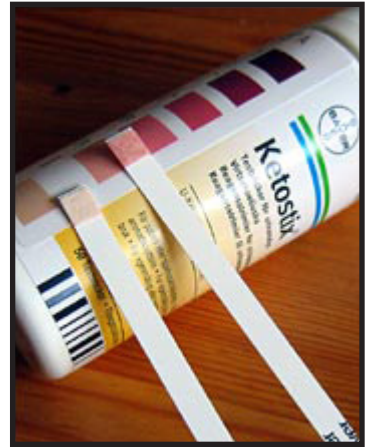
Rick and Dana Empet

Bottleneck: The herd has had continued issues with fresh cows and transition cow health at the time of calving.

Goal: Improve the overall health and longevity of this herd demographic and reduce the incidence of metabolic disease.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Monitor Ketosis after freshening
 - a. Test each cow every day for 7 days after calving for Ketosis
 - b. Use urine keto-stix for diagnosis
 - c. Record findings on all fresh cows
2. Monitor temperatures after freshening
 - a. Record daily temperatures every morning-milking
 - b. Give appropriate treatment to any cow with a temperature over 103 degrees Fahrenheit
3. Record daily milk weights of cows after 4th milking
 - a. Monitor daily milk weight for fresh cows at each milking
4. Any cow that has a milk yield reduction greater than 20% will be monitored through a physical examination and treatment protocol determined
5. Analyze fresh cow data at monthly herd check
 - a. Examine peak/summit milk for entire lactating herd
6. Analyze any metabolic disease occurrence for that particular month and determine trends



SOP Implementation Impact Summary:

1. Adjusted dry cow grain in ration
 - a. Reduced the number of incidences of metabolic diseases
2. Tested any suspect animals for metabolic diseases
 - a. Previously, most cows were calving in with ketosis and underlying milk fever
3. Awareness of protocols for transition animals heightened
 - a. Started doing preventative measures earlier and monitoring becoming routine
4. Followed milk production changes closely
 - a. Visual and physical exams done on any suspect animals
5. Displaced abomasums were reduced

Jimmy Harris

Bottleneck: There was an ever-present issue with lameness in the lactating herd along with some in the heifer population. There seemed to be both infectious and non-infectious causes with no evident connection to a singular reason.

Goal: Determine the cause of lameness in herd and put in place routine to improve locomotion scores throughout the entire herd.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Foot Bath and Environmental Improvements
 - a. Run foot bath 1x weekly with appropriate solution
 - b. Consider alternating foot bath solution for enhanced efficacy against hair heel warts
 - c. Turn cows out to pasture more often in favorable weather
2. Foot Trimming
 - a. Schedule 2 visits per year with 2 days devoted per visit (if necessary)
 - b. Record the number of cows with lameness issues and any lesions that are detected
 - c. Apply treatments as necessary per lesion
3. Locomotion Scoring of Entire Herd (appendix 2, locomotion score sheet)
 - a. Score lactating and dry cows at least twice annually
 - b. Locomotion scoring sheet for evaluation (score between 1-5)
 - c. Divide herd into two categories
 - i. Locomotion scores of 1-2
 - ii. Locomotion scores of 3-5
4. Veterinarian Visits
 - a. Trim lame cows that are either 1) severe or 2) lame between hoof trimming visits
 - i. Assess the cause and record the lesion type
 - b. Review all trimmed lame cows with farmer
 - i. Assess lesion incidence with farmer
 - c. Assess progress twice annually (spring and fall) with farmer and foot trimmer

SOP Implementation Impact Summary:

1. Increased hoof trimming annually to 3-4 times per year
 - a. All cows getting looked at now 1½ to 2 times per year
 - b. Any cows with wraps also receive medicated spray twice daily for 5 days once the wrap is removed
2. Building a foot bath area for when animals leave the barn to go to pasture to walk through
 - a. Scrape and remove rocks from cow walkway to pasture
 - b. Modified grit to shape and cushion the walkway
 - i. Cows walking more freely now over the walkway
3. Preventative measures between hoof trimming
 - a. Hoof spray at first signs of hairy warts
4. Strawberry heel wart incidences have declined



Tom and Shirley Herr

Bottleneck: The dry cow facility was overcrowded which prevented the use of individual calving pens. Additionally, ventilation was an issue due to original barn construction.

Goal: Improve facility ventilation and usage to accommodate increased number of animals and improve health of transition and dry cows.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Improvement of ventilation causing (cow and calf) pneumonia
 - a. Take out existing block wall (side)
 - b. Install curtain system on the (torn out) south-side wall
 - c. Install overhead doors near calving pen (end wall)
2. Addressing overcrowding and feed competition
 - a. Increase space at feed bunk so all cows can eat at the same time
 - b. Increase square footage to avoid overcrowding – 20' x 80' addition to south-side of barn
3. Newborn calf health
 - a. Build separate maternity pen
 - b. Provide clean, well ventilated place for mothers to give birth
 - c. Install water/feeding area for calving cows

SOP Implementation Impact Summary:

1. Addition to the dry cow barn and to the bunk space completed in March 2012
 - a. Original barn was 80' x 40' with 16 headlocks
 - i. Addition of 6 headlocks
 - ii. 20' x 80' addition to the barn with slider curtain
 - b. Increased in cow cleanliness
 - c. Cows are visibly more content
 - i. Less stress on cows and producers from management perspective
 - d. Less competition for feed
 - e. Less pneumonia incidences in the fresh cows
 - f. Greater quality of bunk space
2. Nutrition alteration
 - a. Increased protein in the ration
 - b. Less retained placentas, metritis and displaced abomasums



Thomas Mellott

Bottleneck: Excessive lameness and poor milk quality secondary to cow comfort facility constraints led to poor hygiene and higher incidence of poor longevity in mature cows resulting in a high cull rate and mortality rate.

Goal: Improve locomotion in order to increase herd longevity.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Identification of lameness
 - a. Slight arch to back, slight limp and all greater degree lameness
 - b. All personnel, especially milkers, will be tasked with identifying cases
 - c. Examine and treat within 1-2 days of identification
2. Treatment
 - a. Foot Rot
 - i. Clean between toes, disinfect the area, and provide veterinarian recommended pain alleviation
 - b. Heel Warts
 - i. Clean, dry, wrap and treat with veterinarian recommended solution, and remove wrap in 2-3 days
 - c. Ulcers and Abscesses
 - i. Pare out, wrap and block other toe to provide stability, and remove wrap in 2-3 days
3. Prevention
 - a. Improve hoof and leg hygiene
 - i. Manure removed from back of free-stalls at every milking
 - ii. Groom stalls 3x/week
 - iii. Add sand to stalls 2x/week
 - iv. Foot bath 3x/week
 - v. Alley Scraping
 1. Alley Scrapers – at least 4x daily
 2. Skid loader – 2x daily, while cows are in holding pen
 - b. Cow Comfort
 - i. Free-stall renovations
 1. Higher neck-rail
 2. Open fronts to allow forward lunge
 3. Remove expired mattress
 4. Add bedding retainer
 5. Deeply bed with sand
 - ii. Heat Abatement
 1. Add fans over free-stalls and feed alley
 2. Sprinklers run on timer and thermostat
 3. Fans and sprinklers in holding area



SOP Implementation Impact Summary:

1. New free-stalls with deep bed sand
 - a. Poured new curb to add to stall length
 - b. Stall usage increased
 - c. Cow comfort improved greatly indicated by stall usage
2. New water troughs
3. Eliminated dead ends
4. Removed alley scrapers

Ralph Moyer

Bottleneck: The herd has a chronically high Somatic Cell Counts (SCC) and an increasing number of clinical cases of mastitis.

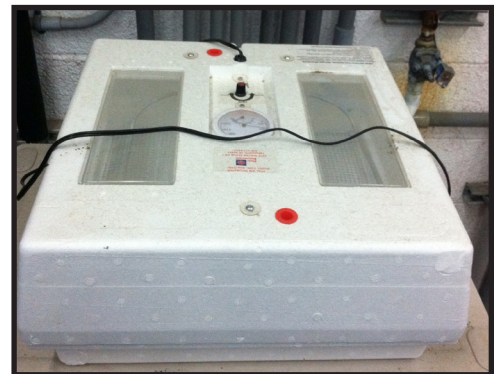
Goal: To improve milk quality by lowering the SCC and clinical and subclinical cases of mastitis and to identify solutions within the robotic milking system and bedding materials.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Records
 - a. Record clinical cases – later able to determine cause of mastitis
 - i. Better able to track reinfection/cure/chronic
 - b. Record culture results of available treatment results
2. Culture
 - a. Culture several clinical cases of lactating cows using on-farm system
 - b. Culture high SCC fresh cows using the CMT protocol
 - c. Determine causative pathogen and treatment protocols to address that pathogen
3. Re-Check
 - a. Evaluate cow 14 days post mastitis case
 - i. Determine if there was a cure
 - b. Possible cow-side SCC monitor purchase that would be more accurate than CMT
4. Treatment protocols based on culture
 - a. Dry off protocol determined based on cows lactation history

SOP Implementation Impact Summary:

1. Robotic milking unit determined suspect cows by color and conductivity of the milk
 - a. Needed more concrete determination of infected animals
2. On farm culture system for mastitis determination implemented and protocols were updated
 - a. Incubator and quad plates for culturing purposes purchased
 - b. As of this summer, 30+ on-farm cultures had been performed on suspect and clinical cows
 - c. Main pathogen identified-Environmental Strep
 - i. Cows identified as infected were treated with mastitis treatment and followed appropriate withhold times practiced
 - d. Using National Mastitis Council's Milk Quality SOPs (<http://www.nmconline.org>)
3. Record keeping of mastitis cases improvement
 - a. Paper and PC Dart records for long term comparisons and decision making on animals



Daniel Smith

Bottleneck: The herd has a problem with hoof and hock care. Since buying outside cattle and introducing them into this herd, hoof problems have been occurring more frequently.

Goal: Reduce the number of hoof and hock issues by obtaining a better assessment of the causes.



SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Hock Scoring
 - a. Hock scoring cows with hock score scale
 - i. Utilize hock scoring system on farm
 - ii. Work with herd veterinarian to determine the scores of the hocks (Appendix 2)
 - iii. Analyze the number of scores greater than 1
2. Identify lame cows earlier
 - a. If cow appears to be lame, treat with standard hoof care product
 - b. At next herd visit, have herd veterinarian assess same cow
 - c. At next hoof trimming, provide the list of potentially lame cows to hoof trimmer to further assess and treat
3. Locomotion Scoring
 - a. Utilize locomotion score sheet to determine the locomotion scores of the herd (Appendix 2)
 - b. Herd veterinarian and farmer will assess cows as they exit the parlor
 - c. Scores will be assessed to determine percentage of herd above a score of 1 and veterinarian will recommend further facility or ration changes to improve locomotion
4. Hygiene Scoring
 - a. Utilize hygiene scoring system to determine cleanliness of the herd (Appendix 2)
 - b. Herd veterinarian will assess the scores and suggest facility modifications and management practices

SOP Implementation Impact Summary:

1. Implemented hock and cleanliness scoring system
 - a. When animals were let outside more routinely, hock and cleanliness scores improved
 - b. Shavings now used for bedding
 - i. Reduced the incidence of poor hock condition
2. Under new management, hoof trimming occurrence will become more regular
3. Hock Scores
 - a. Score of 1=24
 - b. Score of 2= 9
4. Cleanliness Scores
 - a. Score of 1= 16
 - b. Score of 2= 13
 - c. Score of 3= 8
 - d. Score of 4= 1
5. New mattresses input for barn in plans for near future



Dale Weiler

Bottleneck: The herd has a greater than average number of lameness cases, due most often to foot problems (e.g. abscesses). Cases are not evenly distributed. Increased cases occur in the late spring and through summer and are between peak and mid-lactation but do not have any particular age or pasture grazing relationship.

Goal: Identify the causes of the lameness cases and determine the most effective prevention and treatment protocols.

SOPs that will address the Cow Care and Herd Health Bottleneck:

1. Nutrition
 - a. Fiber quality/intake
 - b. Protein – soluble/bypass/quality assessment
 - c. Monitor bi-carbonate levels in the diet at peak lactation
2. Heat Stress
 - a. Water quality, pH, availability
 - b. Increase air flow, especially during heat waves
3. Cow densities and traffic flow
 - a. Increase paddock areas for dry and lactating cows
 - b. Increase stall rest
 - c. Manage steep grades, sharp turns, pushing and shoving
4. Hoof care
 - a. Insert mats in appropriate places for good footing
 - b. Run foot baths more regularly
 - c. Maintenance trimming 2x/year
 - d. Provide greater access to pasture

SOP Implementation Impact Summary:

1. Updated the ration to incorporate more fiber and protein
 - a. An increase in the buffer helped in foot health improvement
2. Hoof trimming increased to twice during the year
 - a. Less abscesses and severe cases
 - b. Blocking some cows helped recovery time
3. Foot bath is run once per week
4. Management and grading of the cow lane to the pasture address with the help of county improvement
 - a. Contacted soil conservation to help build cow lane
5. Heat Stress
 - a. Fans and mat in the feed area are in future plans
 - b. Water availability outside of parlor was added to aid in heat stress





Form A
Cow Care and Herd Health Bottleneck Initial Assessment
DUE APRIL 1st, 2012

Provide the original bottleneck identified:

After initial assessment, list 3 key areas of the bottleneck to address when developing the SOPs:

- 1.
- 2.
- 3.

Provide 3 key measurable indicators that can be used to track progress (i.e. SCC, % of cows with BCS score <3, etc.)

- 1.
- 2.
- 3.



Form B
Standard Operation Procedure Development

DUE APRIL 1st, 2012

List the Standard Operation Procedures that will address the Cow Care and Herd Health Bottleneck with specific steps that will be taken outlined:

1.

a.

b.

c.

2.

a.

b.

c.

3.

a.

b.

c.

4.

a.

b.

c.

Scoring Reference Guide



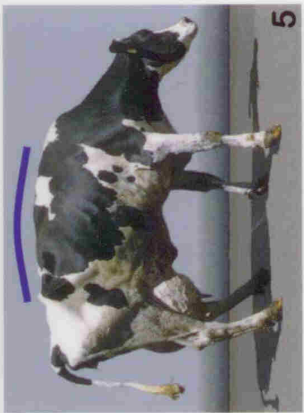
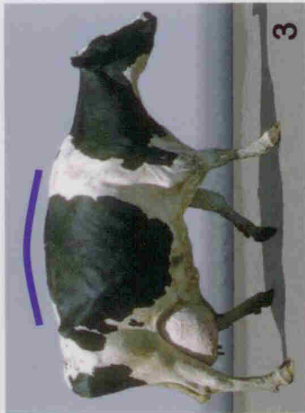
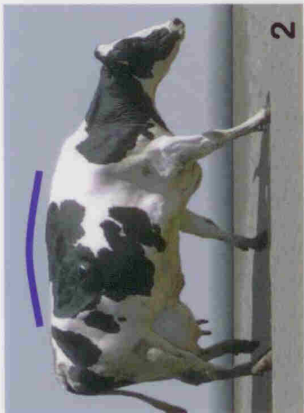
Hygiene Score

- 1 = Clean
- 2 = Manure splatters up into knee area
- 3 = Manure splatters up into udder & belly area
- 4 = Manure splatters up into udder/belly area & onto top of cow



Hock/Knee Score

- 1 = Normal
- 2 = Hair loss
- 3 = Hair loss + swelling

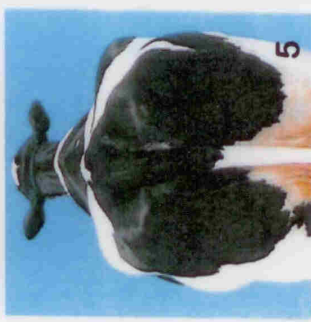
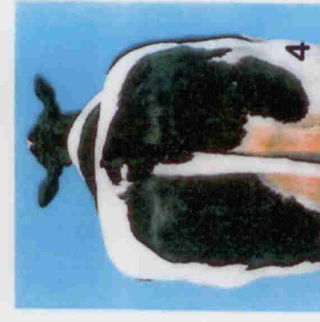


Locomotion Score

- 1 = Normal posture & gait
- 2 = Arches back when walking
- 3 = Arches back when walking and standing
- 4 = Arches back continuously; favors one or more limbs
- 5 = Reluctant to move; tries to avoid bearing weight on affected limbs

SOURCE: Zinpro.com

(http://www.zinpro.com/ASPX_Main/en-US/pdf/Locomotion%20scoring%20guide.pdf)



Body Condition

Score

- 1 = Gaunt; no fatty tissue around tailhead
- 2 = Thin; shallow cavity around tailhead
- 3 = Good condition
- 4 = No depression in loin; short ribs cannot be felt
- 5 = Thick layer of fatty tissue around short ribs

SOURCE: Elanco BCS Guide