Dairy Judging

VOLUME 3

Est. 1989

HOLSTEIN FOUNDATION

"Developing Future Leaders for a Vibrant Dairy Community"

Richard "Dick" Keene
1935 - 2014

This booklet is dedicated to
Richard "Dick" Keene,
who spent a lifetime dedicating himself
as a Holstein breeder and enthusiast,
accredited and highly respected
dairy cattle judge, friend and ambassador
to the dairy and agriculture industries.

After winning the national collegiate dairy judging contest in Waterloo, Iowa, in 1956, Dick established himself as a well-known, highly respected and distinguished national and international dairy cattle judge. He still is the youngest person to ever judge the Holstein Show at World Dairy Expo; and the only person to judge that show five times and the Royal Canadian Exposition twice. He judged numerous shows of other breeds across the country. His personal integrity and honesty as a cattle judge, along with his great eye for cattle, will not be forgotten.

After graduating from Cornell University in 1957, Dick worked as a field man and classifier for Holstein USA. In 1960, he returned home to Keeneland Farm, Gilbertsville, NY where he devoted half a century to breeding and developing outstanding generations of excellent cows and cow families.

Dick's dedication, vision, and exemplary leadership to the dairy industry were impeccable. He served as Director, Vice President and President of Holstein Association USA. During his years as a National Director, Dick served on the type committee, helping make modifications to the true type model Holstein cow.

Dick's professional service, guidance and leadership were impressive, serving as a member and elder of the Gilbertsville Presbyterian Church, director of a local, private bank, member of county Extension and Farm Bureau committees, Farm Service Agency advisory committees and Cornell Ag Advisory Committee, local school board, as well as a long-time member of his county Holstein Club and local Rotary Club.

Dick's family received the first NY State Governor's award, recognizing farm families for excellence and contributions to agriculture. He received Cornell University's Outstanding Alumni Award; and in 2007 received National Dairy Shrine's distinguished service award.

Dick's wife Shirley adds, "His passion for youth inspired him to help young people reach their goals and potential. For many years, Dick served as a 4-H organizational leader and dairy judging coach, guiding many 4-H members to place well at State and National 4-H dairy judging contests".

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This Dairy Judging workbook is designed to help individuals develop a system to effectively evaluate dairy cattle conformation, as well as providing guidance in preparing oral reasons. Dairy judging can be a rewarding activity for people of all ages, and teaches valuable communication and critical thinking skills to those who participate.

The Holstein Foundation's mission is to educate and develop future leaders for a vibrant dairy community. The Holstein Foundation offers a variety of programs to youth, young adults and farm families. Current programs targeting youth include the popular Dairy Bowl and Dairy Jeopardy competitions. The Foundation also focuses on youth education and outreach activities, offering free workbooks, and ribbons for local shows.

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JUDGING DAIRY COWS

Dairy judging is an activity that allows you to have fun while building dairy knowledge and developing other important skills such as public speaking, critical thinking, decision making and self-confidence.

Many different aspects of dairy judging are covered in this book:

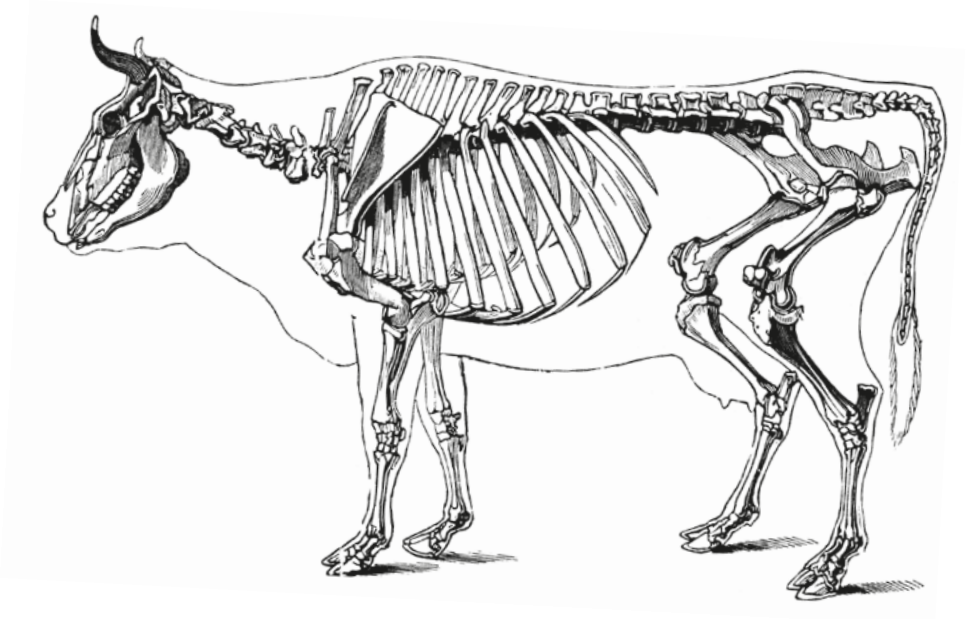
- Dairy Cow Unified Scorecard and major breakdowns
- Dairy judging terminology
- Preparing oral reasons
- Linear evaluation of dairy cattle
- Plus many worksheets and helpful tips to help you build and refine your skills

See Page 42 for the Parts of a Cow Activity Worksheet

A fundamental first step in learning to judge dairy cattle is to develop a thorough knowledge of dairy cattle anatomy – both internal and external. This will help you see relationships between the different parts of the body, and also help in developing your terminology.

Below you will see a diagram of a cow's skeletal system, and on the next page, on the Dairy Cow Unified Scorecard, you will see a diagram that will help you learn the body parts of a cow. Compare the two side-by-side and see how the bone structure affects what you see in the frame of the cow.

Once you think you've mastered bovine anatomy, turn to page 42 for the "Parts of a Cow" activity. If you have a chance, using your favorite cow or heifer, see if you can name all the parts on a living dairy animal.



DAIRY COW UNIFIED SCORECARD

Breed characteristics should be considered in the application of this scorecard.

MAJOR TRAIT DESCRIPTIONS

There are four major breakdowns on which to base a cow's evaluation. Each trait is broken down into body parts to be considered and ranked.

	Perfect Score
1) Frame - 15%	15
2) Dairy Strength - 25%	25
3) Rear Feet and Legs - 20%	20
4) Udder - 40%	40
TOTAL	100

1) Frame - 15%

The skeletal parts of the cow, with the exception of rear feet and legs. Listed in priority order, the descriptions of the traits to be considered are as follows:

Rump (5 points): Should be long and wide throughout. Pin bones should be slightly lower than hip bones with adequate width between the pins. Thurls should be wide apart. Vulva should be nearly vertical and the anus should not be recessed. Tail head should set slightly above and neatly between pin bones with freedom from coarseness. **Front End (5 points):** Adequate constitution with front legs straight, wide apart, and squarely placed. Shoulder blades and elbows set firmly against the chest wall. The crops should have adequate fullness blending into the shoulders. **Back/Loin (2 points):** Back should be straight and strong, with loin broad, strong, and nearly level. **Stature (2 points):** Height including length in the leg bones with a long bone pattern throughout the body structure. Height at withers and hips should be relatively proportionate. Age and breed stature recommendations are to be considered. **Breed Characteristics (1 point):** Exhibiting overall style and balance. Head should be feminine, clean-cut, slightly dished with broad muzzle, large open nostrils and strong jaw.

2) Dairy Strength - 25%

A combination of dairyness and strength that supports sustained production and longevity. Major consideration is given to general openness and angularity while maintaining strength, width of chest, spring of fore rib, and substance of bone without coarseness. Body condition should be appropriate for stage of lactation. Listed in priority order, the descriptions of the traits to be considered are as follows:

Ribs (8 points): Wide apart. Rib bones wide, flat, deep, and slanted towards the rear. Well sprung, expressing fullness and extending outside the point of elbows. **Chest (6 points):** Deep and wide floor showing capacity for vital organs, with well-sprung fore ribs. **Barrel (4 points):** Long, with adequate depth and width, increasing toward the rear with a deep flank. **Thighs (2 points):** Lean, incurving to flat and wide apart from the rear. **Neck (2 points):** Long, lean, and blending smoothly into shoulders; clean-cut throat, dewlap, and brisket. **Withers (2 points):** Sharp with chine prominent. **Skin (1 point):** Thin, loose, and pliable.

3) Rear Feet and Legs - 20%

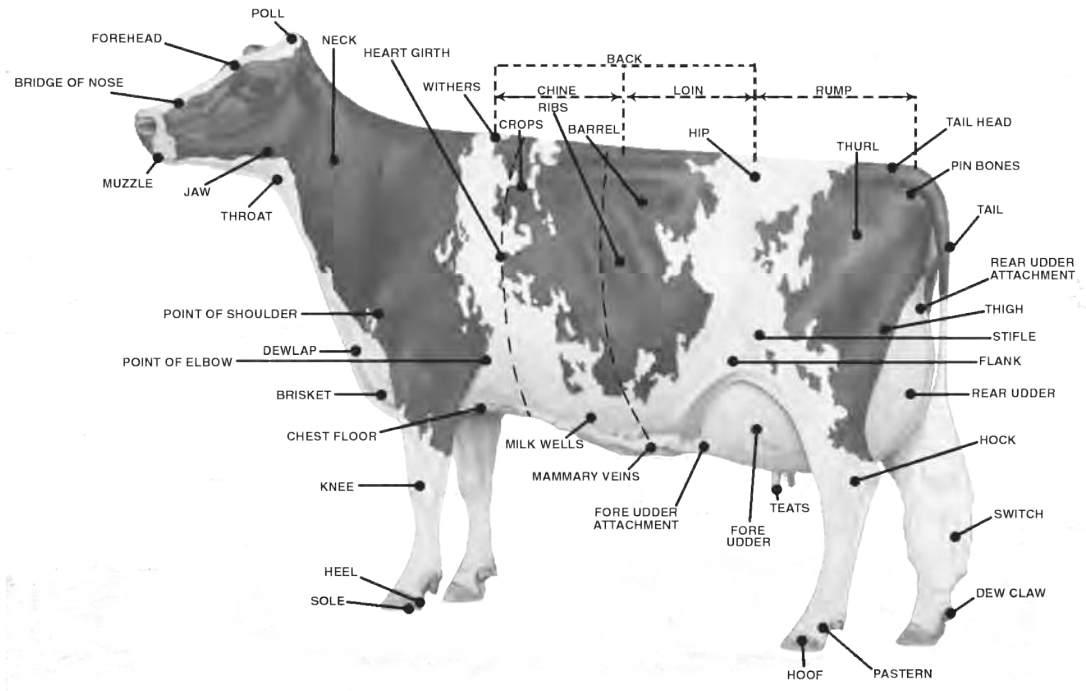
Feet and rear legs are evaluated. Evidence of mobility is given major consideration. Listed in priority order, the descriptions of the traits to be considered are as follows:

Movement (5 points): The use of feet and rear legs, including length and direction of step. When walking naturally, the stride should be long and fluid with the rear feet nearly replacing the front feet. **Rear Legs-Side View (3 points):** Moderate set (angle) to the hock. **Rear Legs-Rear View (3 points):** Straight, wide apart with feet squarely placed. **Feet (3 points):** Steep angle and deep heel with short, well-rounded closed toes. **Thurl Position (2 points):** Near central placement between the hip and pin bones. **Hocks (2 points):** Adequate flexibility with freedom from swelling. **Bone (1 point):** Flat and clean with adequate substance. **Pasterns (1 point):** Short and strong with some flexibility, having a moderate, upright angle.

4) Udder - 40%

The udder traits are evaluated. Major consideration is given to the traits that contribute to high milk yield and a long productive life. Listed in priority order, the descriptions of the traits to be considered are as follows:

Udder Depth (10 points): Moderate depth relative to the hock with adequate capacity and clearance. Consideration is given to lactation number and age. **Rear Udder (9 points):** Wide and high, firmly attached with uniform width from top to bottom and slightly rounded to udder floor. **Teat Placement (5 points):** Squarely placed under each quarter, plumb and properly spaced. **Udder Cleft (5 points):** Evidence of a strong suspensory ligament indicated by clearly defined halving. **Fore Udder (5 points):** Firmly attached with moderate length and ample capacity. **Teats (3 points):** Cylindrical shape; uniform size with medium length and diameter; neither short nor long is desirable. **Udder Balance and Texture (3 points):** Udder floor level as viewed from the side. Quarters evenly balanced; soft, pliable, and well collapsed after milking. **(Note: In the Holstein breed, an equal emphasis is placed on fore and rear udder (7 points each). All other traits are the same as listed above.)**



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THE SEVEN BREEDS

Ayrshire

Brown Swiss

Guernsey

Red & White

Holstein

Jersey

Milking Shorthorn

BREED CHARACTERISTICS

Except for differences in color, size, and head character, all breeds are judged on the same standards as outlined in the Unified Score Card. If any animal is registered by one of the dairy breed associations, no discrimination against color or color pattern is to be made.

Ayrshire Strong and robust, showing constitution and vigor, symmetry, style and balance throughout, and characterized by strongly attached, evenly balanced, well-shaped udder.
HEAD- clean cut, proportionate to body; broad muzzle with large, open nostrils; strong jaw; large, bright eyes; forehead, broad and moderately dished; bridge of nose straight; ears medium size and alertly carried.
COLOR- light to deep cherry red, mahogany, brown, or a combination of any of these colors with white, or white alone, distinctive red and white markings preferred.
SIZE- a mature cow in milk should weigh at least 1200 lbs.

Brown Swiss Strong and vigorous, but not coarse. Adequate size with dairy quality. Frailness undesirable.
HEAD- clean cut, proportionate to body; broad muzzle with large, open nostrils; strong jaw; large, bright eyes; forehead, broad and slightly dished; bridge of nose straight; ears medium size and alertly carried.
COLOR- body and switch solid brown varying from very light to dark; muzzle has black nose encircled by a white ring; tongue and hooves are dark brown to black.
SIZE- a mature cow in milk should weigh at least 1400 lbs.

Guernsey Strenth and balance, with quality and character desired.
HEAD- clean cut, proportionate to body; broad muzzle with large, open nostrils; strong jaw; large, bright eyes; forehead, broad and slightly dished; bridge of nose straight; ears medium size and alertly carried.
COLOR- shade of fawn and white markings throughout clearly defined.
SIZE- a mature cow in milk should weigh 1200-1300 lbs.; Guernsey does not discriminate for lack of size.

Red & White Rugged, feminine qualities in an alert cow possessing adequate size and vigor.
HEAD- clean cut, proportionate to body; broad muzzle with large, open nostrils; strong jaw; large, bright eyes; forehead, broad and slightly dished; bridge of nose straight; ears medium size and alertly carried.
COLOR- must be clearly defined red and white; black-red and brindle is strictly prohibited.
SIZE- a mature cow in milk should weigh at least 1400 lbs. and be well balanced.

Holstein Rugged, feminine qualities in an alert cow possessing Holstein size and vigor.
HEAD- clean cut, proportionate to body; broad muzzle with large, open nostrils; strong jaw; large, bright eyes; forehead, broad and moderately dished; bridge of nose straight; ears medium size and alertly carried.
COLOR- black and white or red and white markings clearly defined
SIZE- a mature cow in milk should weigh at least 1400 lbs.
UDDER- equal emphasis is placed on fore and rear udder (7 points each), all other traits are the same as listed on the PDCA scorecard.

Jersey Sharpness with strength indicating productive efficiency.
HEAD- proportionate to stature showing refinement and well chiseled bone structure. Face slightly dished with dark eyes that are well set.
COLOR- some shade of fawn with or without white markings; muzzle is black encircled by a light colored ring; switch may be either black or white.
SIZE- a mature cow in milk should weigh at least 1000 lbs.

Milking Shorthorn Strong and vigorous, but not coarse.
HEAD- clean cut, proportionate to body; broad muzzle with large, open nostrils; strong jaw; large, bright eyes; forehead, broad and slightly dished; bridge of nose straight; ears medium size and alertly carried.
COLOR- red or white or any combination (no black markings allowed).
SIZE- a mature cow in milk should weigh 1400 lbs.

FACTORS TO BE EVALUATED

The degree of discrimination assigned to each defect is related to its function and heredity. The evaluation of the defect shall be determined by the breeder, the classifier or judge, based on the guide for discrimination and disqualifications given below.

HORNS
No discrimination for horns.

EYES
1. Blindess in one eye: *Slight discrimination.*
2. Cross or bulging eyes: *Slight discrimination.*
3. Evidence of blindness: *Slight to serious discrimination.*
4. Total blindness: *Disqualification.*

WRY FACE
Slight to serious discrimination.

CROPPED EARS
Slight discrimination.

PARROT JAW
Slight to serious discrimination.

SHOULDERS
Winged: *Slight to serious discrimination.*

CAPPED HIP
No discrimination unless affects mobility.

TAIL SETTING
Wry tail or other abnormal tail settings: *Slight to serious discrimination.*

LEGS AND FEET
1. Lameness- apparently permanent and interfering with normal function: *Disqualification.*
   Lameness- apparently temporary and not affecting normal function: *Slight discrimination.*
2. Evidence of crampy hind legs: *Serious discrimination.*
3. Evidence of fluid in hocks: *Slight discrimination.*
4. Weak pastern: *Slight to serious discrimination.*
5. Toe out: *Slight discrimination.*

UDDER
1. Lack of defined halving: *Slight to serious discrimination.*
2. Udder definitely broken away in attachment: *Serious discrimination.*
3. A weak udder attachment: *Slight to serious discrimination.*
4. Blind quarter: *Disqualification.*
5. One or more light quarters, hard spots in udder, obstruction in teat (spider): *Slight to serious discrimination.*
6. Side leak: *Slight discrimination.*
7. Abnormal milk (bloody, clotted, watery): *Possible discrimination.*

LACK OF ADEQUATE SIZE
Slight to serious discrimination. (Note: Guernsey does not discriminate for lack of size.)

EVIDENCE OF SHARP PRACTICE
(Refer to PDCA Code of Ethics)
1. Animals showing signs of having been tampered with to conceal faults in conformation and to misrepresent the animal's soundness: *Disqualification.*
2. Uncalved heifers showing evidence of having been milked: *Slight to serious discrimination.*

TEMPORARY OR MINOR INJURIES
Blemishes or injuries of a temporary character not affecting animal's usefulness: *Slight to serious discrimination.*

OVERCONDITIONED
Slight to serious discrimination.

FREEMARTIN HEIFERS
Disqualification.

FOUR MAJOR BREAKDOWNS

Understanding major breakdowns and ideal conformation is an important, fundamental skill when learning to judge cattle.

Frame - 15% **Dairy Strength** - 25% **Rear Feet and Legs** - 20% **Udder** - 40%

Frame (15%)

The skeletal parts of the cow, with the exception of rear feet and legs. Listed in priority order, the descriptions of the traits to be considered are as follows:

Rump
(5 points)
- Should be long and wide throughout.
- Pin bones should be slightly lower than hip bones with adequate width between the pins.
- Thurls should be wide apart.
- Vulva should be nearly vertical and the anus should not be recessed.
- Tail head should set slightly above and neatly between pin bones with freedom from coarseness.

Front End
(5 points)
- Adequate constitution with front legs straight, wide apart, and squarely placed.
- Shoulder blades and elbows set firmly against the chest wall.
- The crops should have adequate fullness blending into the shoulders.

Back /Loin
(2 points)
- Back should be straight and strong, with loin broad, strong, and nearly level.

Stature
(2 points)
- Height including length in the leg bones with a long bone pattern throughout the body structure.
- Height at withers and hips should be relatively proportionate.
- Age and breed stature recommendations are to be considered.

Breed Characteristics
(1 point)
- Exhibiting overall style and balance.
- Head should be feminine, clean-cut, slightly dished with broad muzzle, large open nostrils and strong jaw.

Dairy Strength (25%)

A combination of dairyness and strength that supports sustained production and longevity. Major consideration is given to general openness and angularity while maintaining strength, width of chest, spring of fore rib, and substance of bone without coarseness. Body condition should be appropriate for stage of lactation. Listed in priority order, the descriptions of the traits to be considered are as follows:

Ribs
(8 points)
- Wide apart.
- Rib bones wide, flat, deep, and slanted towards the rear.
- Well sprung, expressing fullness and extending outside the point of elbows.

Chest
(6 points)
- Deep and wide floor showing capacity for vital organs, with well-sprung fore ribs.

Barrel
(4 points)
- Long, with adequate depth and width, increasing toward the rear with a deep flank.

Thighs
(2 points)
- Lean, incurving to flat and wide apart from the rear.

Neck
(2 points)
- Long, lean, and blending smoothly into shoulders; clean-cut throat, dewlap, and brisket.

Withers
(2 points)
- Sharp with chine prominent.

Skin
(1 point)
- Thin, loose, and pliable.

Rear Feet and Legs (20%)

Feet and rear legs are evaluated. Evidence of mobility is given major consideration. Listed in priority order, the descriptions of the traits to be considered are as follows:

Movement *(5 points)*	• The use of feet and rear legs, including length and direction of step. • When walking naturally, the stride should be long and fluid with the rear feet nearly replacing the front feet.
Rear Legs-Side View *(3 points)*	• Moderate set (angle) to the hock.
Rear Legs-Rear View *(3 points)*	• Straight, wide apart with feet squarely placed.
Feet *(3 points)*	• Steep angle and deep heel with short, well-rounded closed toes.
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Udder (40%)

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Teat Placement *(5 points)*	• Squarely placed under each quarter, plumb and properly spaced.
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Fore Udder* *(5 points)*	• Firmly attached with moderate length and ample capacity.
Teats *(3 points)*	• Cylindrical shape; uniform size with medium length and diameter; neither short nor long is desirable.
Udder Balance and Texture *(3 points)*	• Udder floor level as viewed from the side. • Quarters evenly balanced; soft, pliable, and well collapsed after milking.

***Note: In the Holstein breed, an equal emphasis is placed on fore and rear udder (7 points each). All other traits are the same as listed above.**

TERMINOLOGY

When starting to evaluate cattle at home or during judging practices, it can be helpful to begin by just placing two cows at a time. Decide which is more correct, and develop reasons for placing one cow over the other. As you become more comfortable placing two animals in a timely fashion, work your way up to placing four animals in a class.

Developing a broad vocabulary of dairy judging terminology can help you give accurate, thorough reasons and help people to know exactly what you are talking about, even if the cattle aren't right in front of you. Start by learning a few terms describing each trait, then as you develop confidence, try and learn a few new terms each week.

See Page 43 for the Dairy Terminology Activity Worksheet

Frame

RUMP

Positive Terms

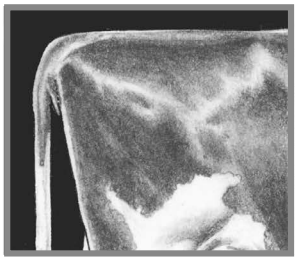
- more nearly level from hooks to pins
- more correct slope from hips to pins
- less slope from hips to pins
- longer and leveler from hooks to pins
- wider through the rump
- wider in the pins (thurls or hips)
- more width at the thurls
- less prominent in her tail setting
- more correct tail head setting
- neater at the tail head
- tail head placed more neatly between the pins
- flatter tail head setting
- thurls more centrally/correctly placed

Negative Terms

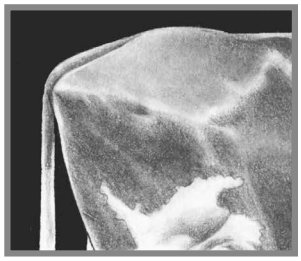
- shorter, narrower rump
- narrower through the hooks and pins
- sloping and pinched in the rump
- more sloping in the rump
- higher at the pins
- reverse tilt to the rump
- higher and coarser at the tail head

Rump Angle

Pins clearly higher than hooks



Slight slope from hooks to pins



Extremely sloped from hooks to pins

Rump Width

Extremely narrow

Intermediate width

Extremely open

FRONT END (SHOULDERS)

Positive Terms

- smoother blending shoulder
- tighter at the point of shoulder
- fuller at the point of elbow
- tighter at the point of elbow
- less prominent at the point of elbow
- fuller in the crops
- more harmonious blending through the front end
- blending more smoothly into the fore rib
- blends more smoothly throughout

Negative Terms

- coarser shoulder
- looser shoulder
- open behind the shoulders
- more prominent at point of shoulder
- winged-shoulders
- weaker in the crops

BACK/LOIN

Positive Terms

- straighter down her topline; especially stronger in the loin (or chine)
- leveler down the topline
- straighter and stronger over the top
- harder down her topline
- stronger in the loin
- stronger in the chine

Negative Terms

- weak in the loin
- easy over the topline
- weaker over the topline
- weak in the chine and crops

STATURE

Positive Terms

- taller, more upstanding
- taller at the point of withers
- more upstanding in the front end
- excels in size and scale

Dairy Strength

BODY CAPACITY

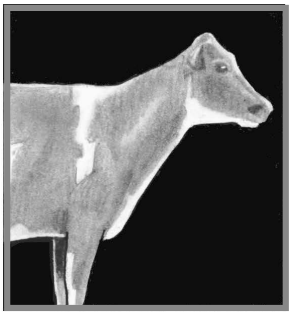
Positive Terms

- stronger, more powerful cow
- more strength and power
- more powerful through the front end
- more total cow
- more length of body
- longer from end to end
- longer bodied cow
- greater spring of rib
- more spring of rib
- more spring of fore rib
- more width and strength throughout
- more width and strength in the chest
- wider through the chest floor
- stronger through the front end
- fuller in the crops
- fuller behind the shoulders
- fuller in the heart girth
- deeper in the chest
- deeper in the barrel
- deeper in the rear rib
- deeper in the fore rib
- deeper in the flank
- more depth of body
- more depth of fore and rear rib

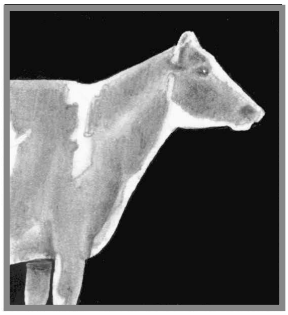
Negative Terms

- less spring of rib
- shallow fore and rear rib
- narrow chest floor
- pinched in the chest
- weak front-ended cow
- weak crops
- shallow in the heart
- short-bodied
- shallow-ribbed
- shallow-bodied
- narrow, weak, and frail
- ribs lacking in fullness and spring
- tight-ribbed

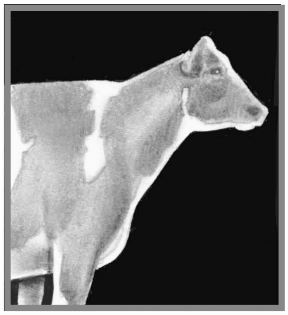
Strength



Extremely narrow and frail

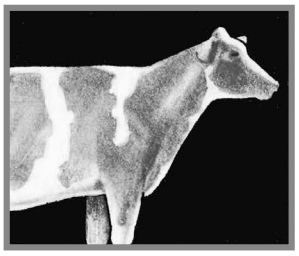


Intermediate



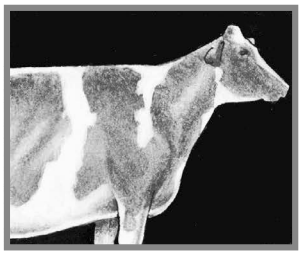
Extremely strong & wide

Body Depth



Extremely shallow body

Intermediate



Extremely deep body

HEAD

Positive Terms

- more breed character about the head
- more alertness and style
- more dish to the face
- wider muzzle
- more femininity about the head
- more style about the head
- cleaner, more refined head

Negative Terms

- plainer about the head
- narrow in the muzzle
- parrot jaw
- wry face
- head lacks style and breed characteristics
- roman-nosed
- coarse about the head
- short and plain about the head

DAIRYNESS

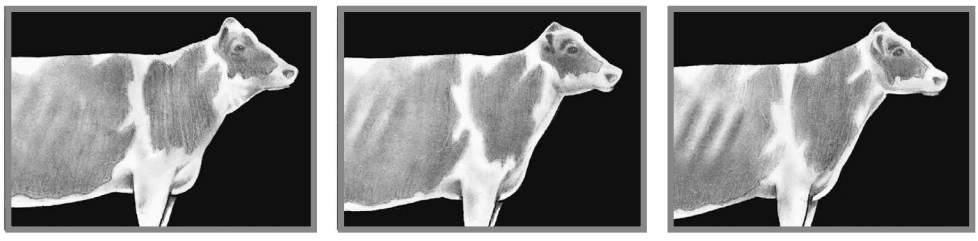
Positive Terms

- more dairyness throughout
- more angularity
- more refined
- milkier appearance
- cleaner and more angular
- longer and more open
- more openness of rib
- more open in her conformation
- longer and leaner neck
- less excess conditioning
- less excess flesh
- less throaty
- sharper over the shoulders
- sharper at the point of withers
- cleaner down the topline
- more prominent about the hips and pins
- more well defined over hip and pin bones
- flatter (leaner or thinner) in the thighs
- more incurving in the thighs
- flatter boned

Negative Terms

- carries more condition throughout
- shorter, thicker neck
- thicker thighs
- tighter ribbed
- throatier
- plainer
- carrying excess flesh in the throat, brisket or dewlap
- coarser and thicker about her head and neck
- thick and fleshy about the throat and neck

Dairy Form



Extremely tight | Intermediate | Extremely open

Rear Feet and Legs

Positive Terms

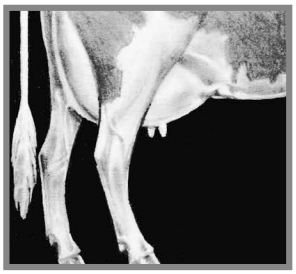
- tracks straighter when viewed from behind
- more correct set to the hock
- less set to the hock
- more set to the hock
- cleaner hock
- more refined hock
- more feminine and clean about the hock
- cleaner leg bone
- flatter hock
- more strength and substance of bone
- stands more squarely on her rear legs
- walks more comfortably on her rear legs
- walks more freely on the rear legs
- more flex of the hock and strength of pastern
- exhibits more mobility/more mobile
- tracks straighter
- more correct foot shape
- steeper foot angle
- stronger in the pasterns
- deeper in the heel

Negative Terms

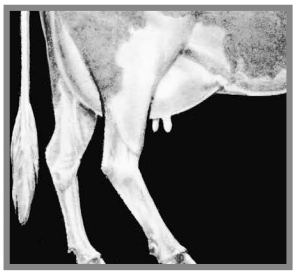
- shallow heel
- weak pasterns
- too much set to her rear legs when viewed from the side
- post-legged
- toes out
- coarse boned
- more coarseness at the hock
- thick in the hock
- puffy about the hock
- lacking substance of bone
- hocks in when viewed from the rear

Rear Legs - Side View

Posty and straight



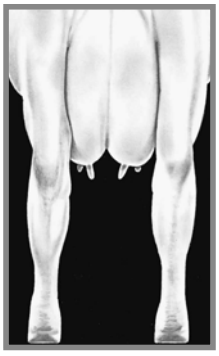
Intermediate set in hock



Extremely sickled

Rear Legs - Rear View

Severe toe-out



No toe-out

Foot Angle

Extreme low angle

Intermediate angle

Extremely steep angle

Udder

GENERAL UDDER TERMS

Positive Terms

- she has an advantage in stage of lactation, with more bloom and capacity of udder (be sure to only use this if you're sure of the stage of lactation)
- milkier appearing udder
- larger, more capacious udder
- showing more bloom
- shows more apparent udder quality
- more prominent veining
- exhibits more bloom and capacity of udder
- more shapely udder

UDDER CLEFT

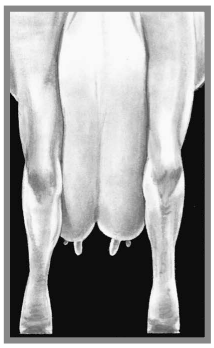
Positive Terms

- more youthful udder
- carries her udder higher above the hocks
- stronger center support in the udder
- deeper crease in her udder
- deeper cleft in the udder
- more clearly defined halving in the udder
- stronger center attachment
- more crease in the udder
- more cleft in the udder
- leveler on the udder floor
- less quartering when viewed from the side
- more nearly level on the udder floor when viewed from the side
- more balance and symmetry to the udder
- more balance of udder

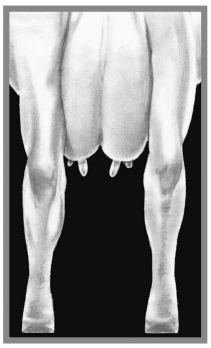
Negative Terms

- weaker attachments
- less halving
- stale (udder lacks bloom)
- udder lacking cleavage
- lacks udder support
- light quarter (be sure to note which quarter)
- flatter on the udder floor
- lacks a crease to the udder when viewed from the rear

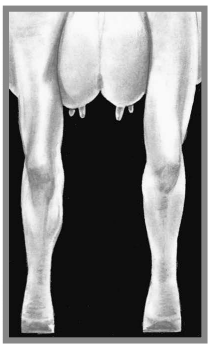
Udder Depth



Very deep udder floor well below hocks

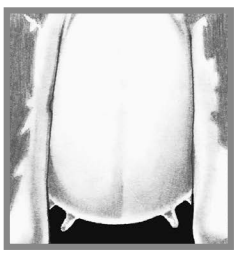


Udder floor above hocks

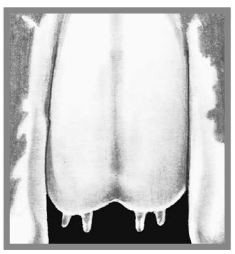


Extreme height of udder floor above hocks

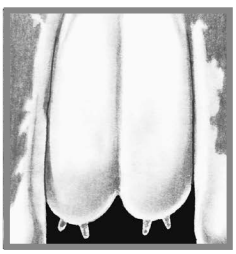
Udder Cleft



Weak cleft



Intermediate



Extremely strong cleft

REAR UDDER

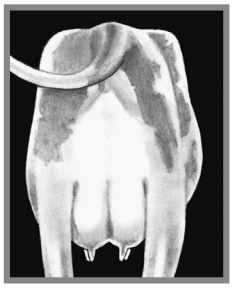
Positive Terms

- higher in the rear udder attachment
- wider in the rear udder attachment
- higher and wider in the rear udder
- stronger in the rear udder attachment
- fuller at the top of the rear udder
- more fullness to the rear udder
- more symmetry and balance of rear udder
- more balance of rear quarters
- more shapely rear udder
- more capacious rear udder

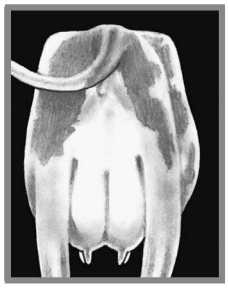
Negative Terms

- poorly attached rear udder
- lower in the rear udder attachment
- pinched and narrow rear udder
- weak and narrow in the rear udder attachment

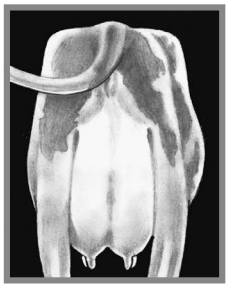
Rear Udder Height



Extremely low

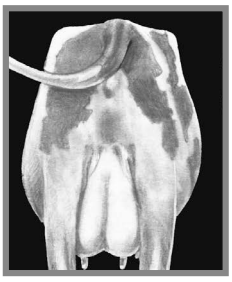


Intermediate height

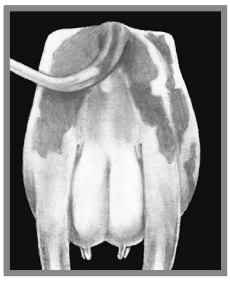


Extremely high

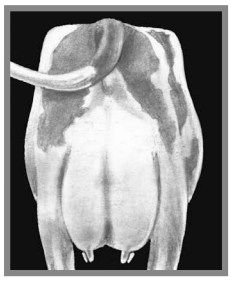
Rear Udder Width



Narrow rear udder



Intermediate width



Extremely wide rear udder

TEATS

Positive Terms

- more desirable teat size, shape, and/or placement
- more desirable teat shape
- teats hang more perpendicular to the ground
- teats more squarely placed on the quarters
- teats placed more centrally beneath the quarters
- teats more neatly set on the udder floor
- teats placed more correctly beneath each quarter
- more nearly correct front teat placement
- more correct teat placement as viewed from the rear

Negative Terms

- funnel, or pencil-shaped teats
- teats too long
- teats too small
- teats placed on the edge of the quarters
- teats hang too close together

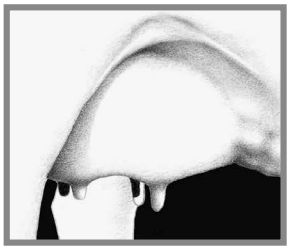
Front Teat Length

1-1/4 inches or smaller

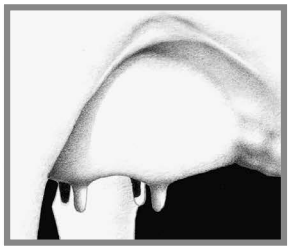
2-1/4 inches

3-1/4 inches or longer

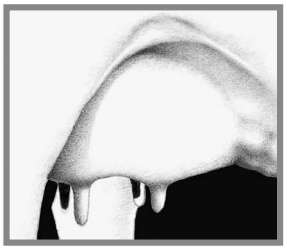
Rear Teat Length



1-1/4 inches or smaller

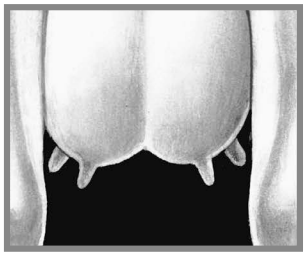


2-1/4 inches

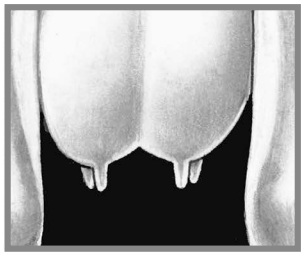


3-1/4 inches or longer

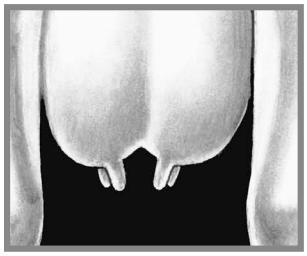
Teat Placement



Extremely wide placement on outside of quarter



Centrally placed on quarter



Base of teats on extreme inside of quarter

FORE UDDER

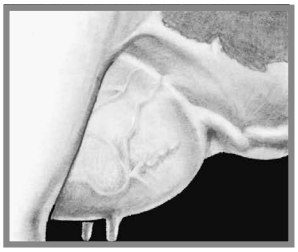
Positive Terms

- fore udder held closer to the body wall
- fore udder blends more smoothly into the body wall
- snugger in the fore udder attachment
- tighter fore udder attachment
- smoother fore udder attachment
- more firmly attached fore udder
- stronger fore udder attachment
- longer, more tightly attached fore udder
- longer fore udder
- less bulgy fore udder

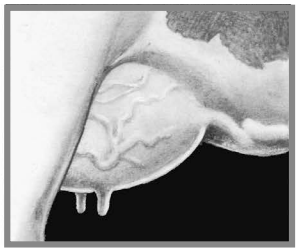
Negative Terms

- loosely attached fore udder
- shorter in the fore udder
- narrower in the rear udder attachment
- bulgier fore udder
- unbalanced fore udder
- light in the left or right rear quarter

Fore Udder Attachment



1-5 pts.
Extremely loose



25 pts.
Intermediate strength

45-50 pts.
Extremely snug & strong

JUDGING DAIRY HEIFERS

Choosing a heifer with the most correct conformation and future potential can be a daunting task. Not only is the udder not developed on heifers, but as they grow, certain faults may disappear while new ones become apparent. Animals who placed at the top of their calf class may not develop the depth of rib desired by dairy producers, and plain yearlings may grow into stylish mature cows. The goal should be to choose heifers which will develop into productive and profitable cows.

When placing heifer classes in a judging contest or at a show:

In the showring, judges should not place any emphasis on a heifer's udder promise, unless it exhibits obvious, severe problems. Heifers which excel in the other categories of the Unified Scorecard, such as frame, dairyness, feet and legs and body capacity typically develop into desirable mature cows. It is important to remember that senior yearlings may carry some extra weight because they are close to calving. Likewise, young calves do not need as much body because they have time to develop.

When choosing replacement or show heifers for your project:

When buying replacement heifers or choosing a show heifer, it's important to realize that, although the udder has not developed, its appearance can be a good indicator of future promise or problems. The udder of an open heifer should not show any signs of development. Characteristics which a person should look for when considering a heifer's udder are correct teat size and placement with the teats pointing slightly inward. Teats which point slightly inward are an indication that the heifer will develop a strongly attached udder. Avoid selecting heifers whose udders are fatty or overdeveloped, as this could lead to poor udder quality and cause difficulties during milking. It may also be a sign of infection or being sucked at a younger age. Strutting teats and flat udder floors are signs of a potentially weak median suspensory ligament which could shorten the productive life of a dairy cow.

See the next page for a Dairy Calf and Heifer Scorecard for guidance on evaluating traits.

DAIRY CALF AND HEIFER SCORECARD

As there is no official scorecard for judging dairy heifers, the following has been developed by Ted Halbach, former coach of the University of Wisconsin-Madison dairy judging team, as a guide.

GENERAL APPEARANCE 35%

Attractive individuality and harmonious blending of parts, with the exception of rear feet and legs, is evaluated. Listed in priority order, the descriptions of the traits to be considered are as follows:

Style and Balance – Harmonious blending of parts; proportionate height, length and depth.
Rump – Long and wide throughout with pin bones slightly lower than hip bones. Thurls wide apart and centrally placed between hip bones and pin bones. Tailhead set slightly above and neatly between pin bones. Tail free from coarseness. The vulva is nearly vertical.
Back – Straight and strong; loin – broad, strong and nearly level; slight arch preferred.
Front End – Adequate constitution with front legs straight, wide apart and squarely placed. Shoulder blades and elbows set firmly against the chest wall. The crops should have adequate fullness.
Breed Characteristics – Clean cut head, broad muzzle with large, open nostrils, and strong jaw.

DAIRY CHARACTER 25%

Evidence of potential milking ability is evaluated. Major consideration should be given to general openness and angularity without weakness, flatness of bone, and freedom from coarseness. Listed in priority order, the descriptions of the traits to be considered are as follows:

Ribs – Wide apart. Rib bones wide, flat, deep, and slanted toward the rear.
Thighs – Lean, incurving to flat and wide apart from the rear.
Withers – Sharp with chine prominent.
Neck – Long, lean and blending smoothly into shoulders; clean cut throat, dewlap, and brisket.
Skin – Thin, loose and pliable.
Allowance should be made for winter and fall yearlings to carry more condition as they approach calving.

REAR FEET AND LEGS 20%

Feet and rear legs are evaluated. Evidence of mobility is given major consideration. Listed in priority order, the descriptions of the traits to be considered are as follows:

Movement – The use of feet and rear legs, including length and direction of step. When walking naturally, the stride should be long and fluid with the rear feet nearly replacing the front feet.
Rear Legs-Side View – Moderate set (angle) to the hock.
Rear Legs-Rear View – Straight, wide apart with feet squarely placed.
Feet – Steep angle and deep heel with short, well-rounded closed toes.
Thurl Position – Near central placement between the hip and pin bones.
Hocks – Adequate flexibility with freedom from swelling.
Bone – Flat and clean with adequate substance.
Pasterns – Short and strong with some flexibility, having a moderate, upright angle.

SIZE 20%

Growth, vigor and good health are evaluated. Major consideration should be given to height at the point of withers. The description of the trait to be considered is as follows:

Stature – Height including length in the leg bones with a long bone pattern throughout the body structure; height at withers and hips should be relatively proportionate.
Barrel – Long, deep and wide; depth and spring of rib increasing toward the rear with a deep flank.
Chest – Deep and wide floor with well sprung fore ribs blending into the shoulders.

PREPARING FOR A JUDGING CONTEST

Learning to judge and competing in judging competitions can be an exciting and rewarding experience for anyone with an interest in dairy cattle. Here is some information you should know when getting started:

Typical Judging Contest Format

- In a dairy judging contest, there are four animals in each class.
- Animals in a class will all be the same age and breed, but within one judging contest, you will likely be judging different ages and breeds of cattle.
- In a typical judging contest, you will be given 12 minutes to place a non-reasons class, and 15 minutes to place a class that you have to give reasons on.
- In most contests, animals are led by volunteers. During the class, animals will circle in both directions, as well as be lined up side-by-side and head-to-tail, so you will have an opportunity to see all sides of an animal and evaluate her movement.

Other Tips for Success

- Practice evaluating cattle from a distance. Most judging contests will have a ring that the animals will be led around, and judging contestants will not be allowed to get very close to the animals.
- Viewing the animals from a distance can often help you see how well the cows fit into your "profile" of an ideal animal, which can help you make your first impression placing more easily.
- At the end of a judging class, you will have to turn in a card with your official placing on it to a contest official. At the beginning of a contest when you get your placings cards, write your name (or contestant number) on them right away, so you don't forget to do it later in the contest.
- Don't rush to turn in your placing card early during a class. Wait to mark it until you are absolutely sure of your placing.
- Make sure that your card is marked clearly and always double check to ensure you marked the placing that you wanted to.

Helpful Hints in Deciding on a Placing

Here are a some "helpful hints" if you find yourself stuck on deciding a placing in a class:

- Look to see if there is a cow that is an "easy winner" or an easy bottom animal. If so, you can eliminate that animal from your consideration and focus on placing the other three animals in the class.
- Another tactic is to look for "pairs" in a class. Are two of the animals obviously more correct than the other two? If you can decide which "half" (top or bottom) of the class an animal should place in you can be confident you will not take a large cut (even if you place the top or bottom pair of animals opposite of the official judge).
- If you are stuck on a pair of cows and are having a hard time deciding how to place them, break them down with the fundamentals of the Unified Scorecard (see page 5). Which cow wears the better udder? Which cow walks on a more correct set of feet and legs? Those two traits make up 60% of the Scorecard (Udder alone is worth 40%), so if you can say that one cow is more correct in those two areas than another, chances are you should place her higher.

- If you are confused and can't decide what to do, step back, take a break breath, clear your head, and start judging the class again as if it's your first time seeing it. If you feel yourself begin to get flustered, relaxing for a moment and clearing your mind can often help you re-focus and make decisions.
- Unless you are sure that you are totally wrong, never change your placing at the very last minute. Trusting your instincts is important in judging, and it's not likely you will be able to give accurate reasons on a placing if you don't have the cows in front of you to take notes.

PREPARING & PRESENTING ORAL REASONS

The job of a judge is not complete when the class is placed. An important part of judging is justifying your placing to the audience, exhibitors or contest officials. Whether it be at a judging contest or a dairy show, a judge must be able to explain his or her decisions. This takes practice in using proper terms in an organized, and interesting style.

Judging is not an exact science. If it was, there would be no need for contests or shows. No two people judge exactly the same. When you are giving your reasons, you need to believe that your placing is the official placing. Have confidence in your placing and convince the official or audience that you examined the animals and have reasons for placing them as you did. Your goal in giving reasons is not to change their minds, but to make them understand your point of view and why the animals were placed as they were.

Confidence is very important when giving reasons. It takes time to develop, but if you practice, you will acquire the determination and poise you need. Start by visualizing yourself as the official judge. See yourself through every process of judging a class and giving reasons. Watch yourself making good, confident decisions. After placing a class, visualize yourself with the microphone or in front of the official giving reasons.

Starting Out

Official reasons are a brief, yet complete statement which justifies your placing. Examine the cows closely in the class so you can visualize each cow in your mind. When giving reasons, make notes about special features that help you remember the animals from the class. Such features can be a different color pattern, colored eartag or an extremely good or poor trait of the animal.

Effective reasons contain comparative terms rather than descriptive terms. Judges should compare each animal to the one placed above it and use terms that tell why. Descriptive terms should only be used to help others visualize exactly which cow you are referring to.

The following is an example of comparative reasons versus descriptive reasons. Think about which set gives you a more complete view of the two cows in question.

Comparative Reasons Example (correct format to use)

"In my top placing, 1 places over 2 for her advantage in overall style and balance. 1 blends more smoothly from neck to shoulder, and shoulder to barrel, as well as being harder down her topline, especially in the loin, and having a more desirable slope from hooks to pins. Additionally, 1 stands on a cleaner, straighter hock, faulting the sickle hock of 2. 1 is much higher and wider in her rear udder attachment and has a deeper udder cleft. Finally, 1 shows more dairyness throughout, being longer and leaner in her neck, sharper at the point of withers, and being silkier and more incurving in her thigh.

I will admit that 2 is a much taller, more upstanding cow and is deeper in the barrel than 1."

Notice how in this example, the two cows are clearly being compared to one another, and clear reasons are given as to why 1 is a superior animal to 2. Comparative terms typically end in "-er" or include the word "more" in front of them. Compare the underlined words above to the words used in the descriptive example, and notice the difference.

Descriptive Reasons Example (incorrect format to use)

"1 places over 2. 1 has good style, and she blends well through the shoulder. She has a straight topline and good rump angle. She also has a good set to her hock. Furthermore, 1 has a high rear udder and a deep udder cleft. Finally, 1 shows good dairy character.

2 is fairly tall and has an extremely deep rib. 2 has good teat placement but is rather low and loose in her rear udder attachment. She also has too much set to her hock and a poor foot angle. Additionally, 2 is weak in her fore udder attachment and carries too much condition today."

This example tells you about the two cows, but doesn't describe to the official (or audience listening) why 1 places over 2 in this class.

Accuracy

Accuracy cannot be stressed enough when giving reasons. Giving reasons that are inaccurate will deduct points more quickly than any other factor. If two animals are very close in a specific trait, it is not worth mentioning unless you use the term, "slight advantage" or "small difference." Accuracy must be considered when selecting the terms to compare or describe specific traits.

A common mistake is to use only a few terms to describe entire categories. For example the term, "size, stretch and scale" is used to compare the height, length and depth of an animal. This term is appropriate only if one animal is taller, longer, and deeper than the other. If the animal is only taller and longer, and not deeper you must use a term which says only that.

People often put the two terms "higher and wider rear udder" together, however, it is not always true. It is quite common for one cow to have a higher but not wider rear udder or vice versa. One way to prevent using inaccurate phrases is to develop a large term vocabulary. When it comes time to give reasons you will be able to use the term that best describes the trait.

Presentation

Speak clearly and loud enough so you are easily understood. It is difficult to be convincing if you speak softly and are unsure of yourself. Eye contact with the official is another important point to remember while giving reasons. To help establish good eye contact, practice giving reasons or just talking while looking in a mirror. You are your biggest critic so if you can maintain eye contact with yourself, it becomes easier to keep eye contact with the official.

Beginners' Reasons Tips

- Always speak in the present tense in your reasons
- When referring to a cow, just use her number. For example, just say "2" instead of "the 2 cow", "cow 2" or "number 2".
- Less is more! Look at a set of reasons you have given in the past and see if there are areas where you used more words than necessary. The fewer words you use, the easier your reasons are to say, and the cleaner you sound. For example, just use "udder" instead of saying "mammary system" and use "dairyness" instead of "dairy character". Using extra words does nothing but make your reasons longer (and can possibly confuse the person listening), so make your reasons complete and accurate, but don't worry about making them last a certain amount of time, and watch out for extra words.
- Your reasons should sound conversational. Read a set of reasons that you have given aloud, and make sure that they sound like you would actually talk if you were having a conversation. It is common (but unnecessary) to insert the word "do" into a grant statement. For example, "I do grant…" or "I do admit…" – your reasons will be more conversational (and less wordy) if you take out that extra word. Small changes can make a big difference!
- Be careful not to overuse the word "today." When you do use it, make sure you are only referring to things that could be different between the two cows tomorrow (or in a month).
    - For example, it would be acceptable to use it occasionally when talking about traits such as body condition

and bloom of udder, which can change with stage of lactation.

- You should not use "today" when discussing traits such as stature and rump angle, as they are not likely to change enough to make a difference in the placing over time.

- Never use the word "better" in a set of reasons.

See pages 45 and 46 for the Beginners' Reasons and Note-taking Worksheets

Taking Notes to Develop Your Reasons

Whether you realize it or not, during every class you place, you are making mental notes that help you sort through the animals and decide upon your final placing. Official reasons are simply organizing those mental notes and saying them aloud. If you have a hard time developing reasons for a placing, or come up with more grants than reasons, you may want to change your placing.

At the beginning of each class, jot down a few notes about each animal to help you remember the cattle and what they looked like. These are usually descriptive, such as "tall black cow," "short, dairy, balanced cow," and "white cow, best udder."

Once you have decided on a placing or have an idea for a placing, start taking your notes. These should help you visualize the class and each animal in it. Design your notes in a way that suits you *(see worksheets on pages 45 and 46)*. Everyone's technique is different – some people write every detail down, while others simply need to list a couple of traits.

Generally, you are allowed between 12 and 15 minutes to judge a reasons class, which does not always allow a lot of time to take notes. Writing out entire sentences or phrases takes a long time (and takes up a lot of space on your paper), so it might be helpful to develop some abbreviations for traits that you commonly use.

Abbreviation Examples

Fore Udder Attachment	4U att
Higher and Wider Rear Udder	HWRU
Feet and Legs	F&L
Teat Placement	TP
Udder Depth	UD
Hips/Hooks and Pins	H > P
Style and Balance	S & B

Basic Format for Giving Reasons

INTRODUCTION
1. State the class (age and breed) *(Example: Four-Year-Old Holstein Cows)*
2. State your placing
3. General statement about the entire class or how the class may have sorted itself into pairs (if applicable)

BODY
4. Outstanding traits about the top cow (if she was an "easy winner")
5. Discussion of your placing for each pair of cows (using comparative terms)

CONCLUSION
6. General statement which justifies placing the last cow on the bottom
7. Re-stating the class and placing

In the following sections, you will find examples of specific portions of a set of reasons.

Introduction

Pick one introduction that suits you and is comfortable for you to say, and use it to introduce all of your sets of reasons.

- I placed this class of Holstein Aged Cows 1-2-3-4.
- My placing is 1-2-3-4 for this class of Holstein Aged Cows.
- After evaluating this class of Holstein Aged Cows, my placing is 1-2-3-4.
- 1-2-3-4 is my placing for this class of Holstein Aged Cows.

For a class where one cow is the top cow in nearly every trait:

"I place this class of Two-Year-Old Brown Swiss Cows 1-2-3-4. 1 easily sorts herself to the top of the class today wearing the best udder, and for her distinct advantages in size and scale, and style and balance."

Look for the placing, age and breed of cows being judged. Also note how the reasons-giver made it clear that this cow was easily the best in the class and why.

When the class has two cows that are very close in the top placing and can be considered a pair:

"1-2-3-4 is my placing for this class of Four-Year-Old Milking Shorthorn Cows. In a close top pair, 1 and 2 handily placed at the top of the class today with their style and balance and tremendous angularity. However, I give the nod to 1 today because she is a taller, longer bodied cow."

This example introduces the class, and explains how the class had a pair of cows that both deserved recognition for their traits. It describes how the top pair was superior to the bottom pair and then goes on to tell why 1 placed over 2.

Body

The body or main portion of your reasons is where you compare the animals, and has three parts:

- first over second
- second over third
- third over fourth

In each part you will compare the two cows using comparative terms. The most important reason for your placing should be first.

For each placing, you should also give a grant. The grant statement points out a trait in which the lower placed animal excels. Look at the following example of a proper set of reasons for the placing of 1 over 2.

"In a close top pair, 1 places over 2, for her advantages in dairyness and angularity. She is more open through her rib structure, longer and leaner in her neck, sharper over her withers, more well defined over her hips and pins, and more incurving in her thigh. She is also much higher and fuller in her rear udder, noting the lack of bloom in 2's rear udder, and longer in her fore udder attachment. Additionally, 1 is more nearly level from hooks to pins, noting the low pins of 2, and has a more desirable tail head setting.

I will admit that 2 keeps this a close placing as she has a more desirable set to her hock, noting the sickle leg of 1, and is stronger over her topline, especially in the loin."

Your oral reasons should sound natural and conversational. Each pair should have three solid reasons why one cow places over another, and at least one grant back for a trait where the lower placed cow was more correct than the higher placed cow.

Within the body of your reasons, you will want to use a variety of connecting terms to help them flow smoothly. Following are some examples of connecting and grant terms.

Connecting Term Examples

furthermore...
in addition to this...
equally as important...
2 is also...
one also...
more importantly...
moreover...
I recognize that...

Grant Term Examples

I admit that 2...
however, 2 has...
I do realize...
this is a close placing, however, because...
I did see that 2 is...
noting that 2 is more...
I grant that 2...
I did not fail to recognize...
yes, I admit...
I do concede...
giving 2 the advantage in...

Conclusion

The conclusion is very important in a set of reasons, because it is the last impression you will make on an audience or reasons judge, so you want it to be a good one! Keep the conclusion short, and don't focus too much on negative qualities of the last place animal. You should give one sentence justifying why the last place animal falls into that spot, and then restate your placing for the class. Remember to give a strong closing and re-state your final placing with confidence. Here are some examples of appropriate conclusions:

For a cow that is correct, but just isn't as stylish as the other animals in her class:

"I justify placing 4 at the bottom of this class, although I admire her tall front end and correctness of feet and legs, I feel she lacks overall style and balance to earn a higher placing.

For these reasons, I placed this class of Two-Year-Old Brown Swiss cows 1-2-3-4."

For a cow that is clearly the poorest quality in the class and has some major functional faults:

"I feel justified in leaving 4 at the bottom of the class, because although she is a very angular cow, she lacks the overall strength of udder attachments, udder quality, and soundness of feet to merit a higher placing.

These are my reasons for placing this class of Two-Year-Old Brown Swiss cows 1-2-3-4."

Note that in both examples, an explanation is given as to why the last place cow was placed there, without dwelling too much on her negative traits, and always mentioning a positive quality that the cow possessed. When discussing the last place cow, try to view it from the perspective of the exhibitor, and how that person might feel if they heard you describe their cow.

For more examples of complete sets of reasons, see the example below, as well as the practice class reasons on page 35.

The following is an example of a complete set of reasons that might be given by a beginner. Notice the different segments – introduction, body, and conclusion.

Jersey Aged Cows
Sample Reasons

INTRODUCTION 4-1-3-2 is my placing for this class of Jersey Aged Cows.

BODY In a close top pair, 4 places over 1 for her advantages in the udder. She has a smoother fore udder attachment, a higher, wider rear udder attachment and a deeper udder cleft. She also is deeper in the barrel and wider through her chest.

I will admit that 1 is leveler in the rump.

Next, 1 places over 3 because she shows more dairyness, being sharper over the withers, more incurving in her thigh, and carrying less condition over her ribs. 1 also carries her udder higher above the hock and is tighter in her fore udder attachment. Additionally, 1 has a more desirable teat size and shape.

I grant that 3 is a deeper bodied cow and shows more spring of rib.

3 places over 2 in my bottom pair for that advantage in body capacity. 3 is a more powerful cow, has more overall depth of body and sweep to her rib. She is also a taller, longer cow, has a more desirable set to her hock, and is higher in her rear udder.

I concede that 2 has a stronger udder cleft.

CONCLUSION I feel justified in leaving 2 at the bottom of the class as she lacks the overall style and balance, as well as udder quality to earn a higher placing.

For these reasons, I place this class of Jersey Aged Cows 4-1-3-2.

Tips to Take Your Reasons to the "Next Level"

Identifiers

Using "identifiers" is an easy way to add a little "extra" to your reasons, and demonstrate to the reasons official that you remember the cattle. Identifiers are things that are obviously different about one cow than all of the others. Make sure that the difference is apparent to anyone that would look at the class so the official doesn't get confused. Identifiers can be used in place of the animal's number to help add variety to your reasons.
Examples of identifiers:

- Black cow, white cow, speckled cow
- Roan cow (Milking Shorthorns), red cow
- Lighter colored cow (Jerseys or Brown Swiss)
- Cow wearing the black halter
- Cow with the docked tail / short switch
- Cow with the yellow ear tag
- Stub horned cow
- Cow with the wrapped hoof
- Cow with the neck chain

Connectors

Connectors help greatly with the flow of your reasons, but are often overlooked by novice judges. Examples of connectors:

- "In a close top placing…"
- "Next, in my middle pair..."
- "Finally, in a more logical bottom placing…"

Using terms such as these, rather than just jumping from one pair to another helps catch the reason listener's attention and ensures that they know which placing you are describing. Using these connecting terms often also gives you a chance to pause briefly and refocus yourself between pairs. This is a good place to note if you felt a pair was close, or an easier placing.

Two-Way Traits

Describing two-way traits is another way to add more detail to your reasons and demonstrate your knowledge of dairy cattle anatomy. A two-way trait is one that the intermediate of a trait is most desirable. This gives you a chance to add detail, noting the fault of the lower placing animal. For example:

- "1 has a more correct set to her hock, noting the sickle/straight leg of 2"
- "1 is more nearly level from hooks to pins, faulting the low/high pins of 2"
- "1 has a more desirable teat length, noticing the long/short teats of 2"
- "1 has a more desirable teat placement, recognizing the widely/closely placed teats of 2"

PRACTICE JUDGING CLASS

On the following pages are three practice judging classes. Decide on your placing for each class, and mark the judging card below. After you determine your placing, practice taking reasons notes for a pair in the class. A sample note-taking worksheet can be found on page 46. Taking proper notes will help when you are formulating your reasons.

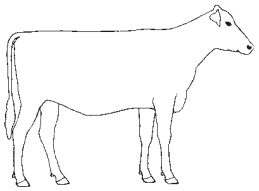
When you are finished with your placing and notes, as an example you can view the official placing for the Holstein Aged Cows, what a set of notes for that class might look like, and an example set of reasons for the class on pages 34 and 35.

For more practice classes, the Holstein Foundation recommends obtaining copies of the *Hoard's Dairyman* Annual Cow Judging Contest. That activity could be a great way to kick off your judging practices starting in the winter months.

Mark your placing on the card below for the practice classes.

Extra placing cards can be found on page 44.

Placing Card



Contestant Name

Class #
#1

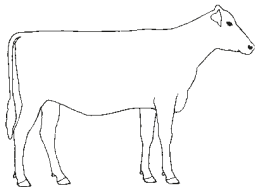
Class
Aged Cows

Breed
Holstein

Score

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

Placing Card



Contestant Name

Class #
#2

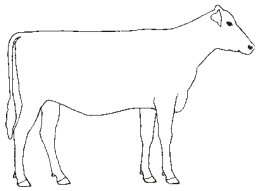
Class
Two-year-olds

Breed
Holstein

Score

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

Placing Card



Contestant Name

Class #
#3

Class
Two-year-olds

Breed
Jersey

Score

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

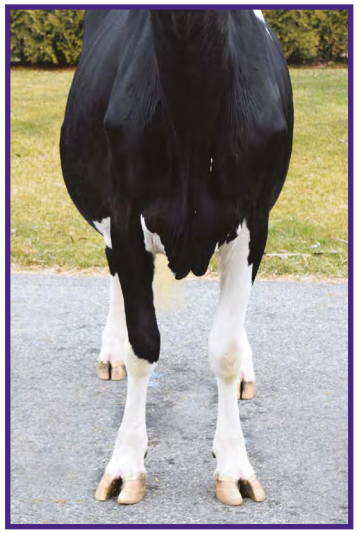
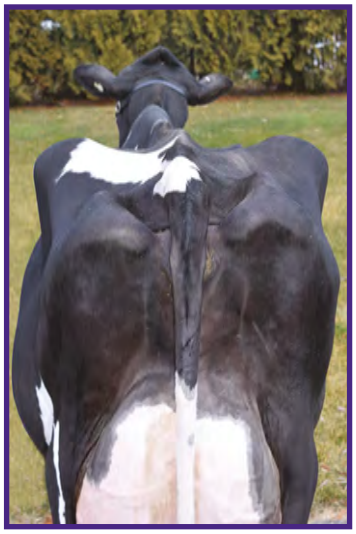
Practice Class #1 - Holstein Aged Cows

#1

#2

Practice Class #1 - Holstein Aged Cows (continued)

#3

#4

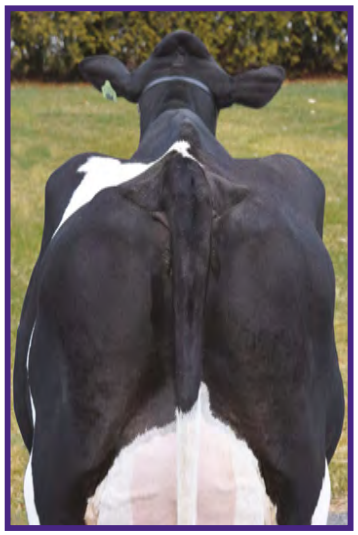
Practice Class #2 - Holstein Two-Year-Olds

#1

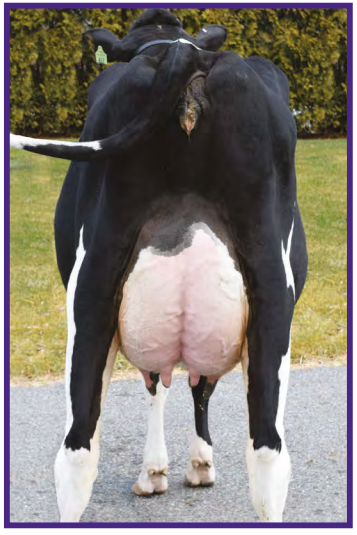
#2

Practice Class #2 - Holstein Two-Year-Olds (continued)

#3

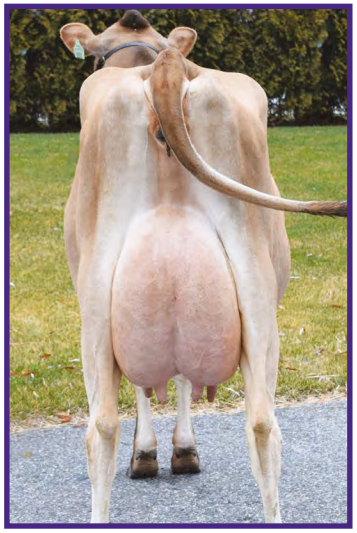


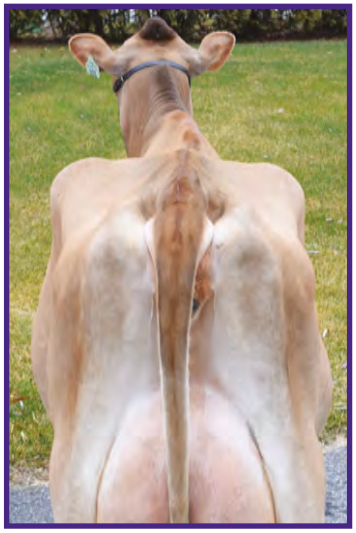
#4



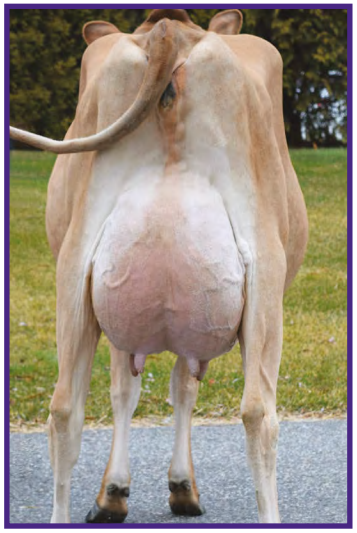
Practice Class #3 - Jersey Two-Year-Olds

#1



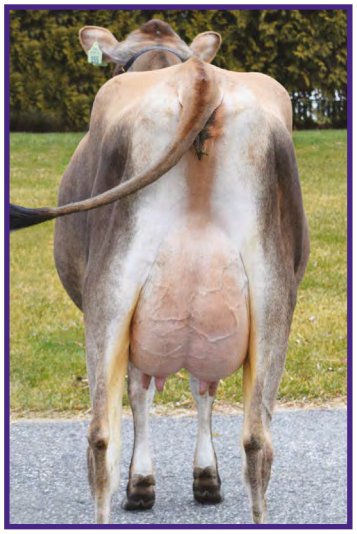


#2

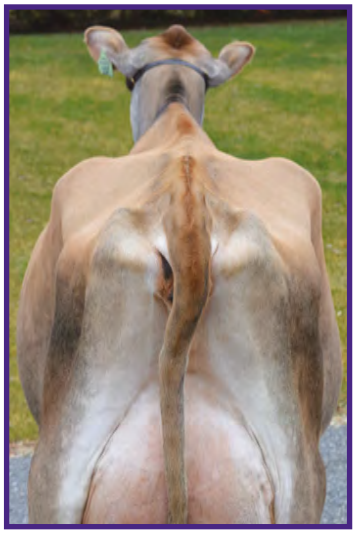


Practice Class #3 - Jersey Two-Year-Olds (continued)

#3



#4



Sample: Completed Notes for Practice Class

Note how the person here wrote just enough in their reasons to help them develop complete thoughts. Also see how notes were made on each cow of identifiers (color, etc.) and major traits that stood out.

Breed: Holstein **First Impression:** 4 2 3 1

Age: Aged Cows **Final Placing:** 4 3 2 1

1

1. Mostly black
2. Toes out
3. Most immature

easier 4 / 3

1. More S&B, blends smoother
2. Wider chest
3. More correct leg (3=sickle)

Grant 3 HWRU

2

1. Lacks spring of rib
2. Wide rear udder
3. Light right rear quarter

close 3 / 2

1. Taller, longer, deeper
2. Tracks straighter on rear legs
3. Higher RW, more balanced in quarters (2 light RRQ)

Grant 2 leveler across udder floor

3

1. Big black cow
2. Extreme dairy
3. Sickle legs

closer 2 / 1

1. More dairyness throughout
2. Cleaner hock
3. More desirable teat placement (1 = wide)

Grant 1 more youthful udder

4

1. White cow
2. Lots of rib
3. Showy

Leave 1 last

Admire Admire shallow udder

leave last because

1. Lacks length of 4U, teat placement, dairyness

The official placing of the Holstein Aged Cows is 4-3-2-1. The cuts are 3-2-1. The following is an example of official reasons written by a recognized dairy judge for the Holstein Aged Cow practice class.

Holstein Aged Cows
Practice Class Official Reasons

I placed this class of aged Holstein cows 4-3-2-1.

I placed the white cow over 3 on her advantage in style and balance as she blends more correctly from neck to shoulder and shoulder to barrel. 4 is also fuller in her crops and tighter at the point of elbow. Still further, she has more width of chest. 4 also has a more correct set to her hock, noting that 3 has too much set. Moreover, 4 also has a leveler udder floor, noticing that 3 has too much reverse tilt.

I would grant that 3 is higher and wider in her rear udder.

In my middle pair, 3 places over 2 on her advantage in frame. She is a taller, longer cow from end to end that has more depth, spring and sweep of both fore and rear rib. 3 also tracks straighter on her front feet and legs. To tip the scales even further, 3 is longer in her fore udder, higher in her rear udder and shows more balance in her rear quarters, noting that 2 is light in her right rear quarter.

I do admit 2 is leveler on her udder floor.

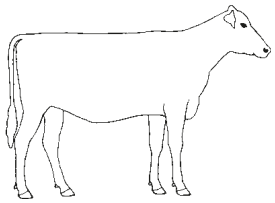
In my final pair, in a closer placing, I placed 2 over 1 as she has more dairyness throughout. She is longer and leaner in her neck, cleaner through her hooks and pins and more incurving in her thigh. 2 is also cleaner in the molding of her hock. I also prefer the teat placement of 2.

However, the black cow is more youthful in her udder.

I do admire the shallow udder of 1, but I feel she lacks the length of fore udder, correctness of teat placement and dairyness and angularity of the other cows in the class.

For these reasons I placed this class of aged Holstein cows 4-3-2-1.

Placing Scorecard



Class #
#1

Class
Aged Cows

Breed
Holstein

1234	30
1243	33
1324	32
1342	37
1423	38
1432	40
2134	31
2143	34
2314	34
2341	40
2413	40
2431	43
3124	35
3142	40
3214	36
3241	42
3412	46
3421	47
4123	44
4132	46
4213	45
4231	48
4312	49
4321	50

Official Placings and Cuts for other Practice Classes

The official placing of the Holstein Two-Year-Olds is 2-4-1-3. The cuts are 2-4-2.

The official placing of the Jersey Two-Year-Olds is 2-4-3-1. The cuts are 2-3-5.

Assigning Cuts & Scoring Placings

Knowing how to score creates an awareness of how you are doing in practices and contests.

The official judge for a contest of four animals will give the official placing, such as 3-2-4-1. After placing the class, the official judge needs to decide how difficult it was to place each pair. The number value given for the difficulty in placing a pair is known as a cut. The judge will assign a higher cut to easier placings with a lower cut on more difficult placings. An example of cuts would be 7-2-5. This would mean that the first and last pair were easy placings because they had a higher cut with the middle pair being a difficult placing. The highest total that cuts can add up to (adding the three numbers together) on a class is 15. The highest score that can be given for placing a class correctly is 50. Your score is determined by subtracting the cuts from that perfect score.

When scoring, always use your placing as the guide. You will then compare your placing to the official placing by setting up a table of six comparisons like in the examples. The six comparisons are your 1st place animal to your 2nd place animal, your 1st to your 3rd, your first to your 4th, your 2nd to your 3rd, your 2nd to your 4th, and your 3rd to your 4th. After writing down the six comparisons ask this question to each comparison: I placed ___ over ____ is that correct? If the answer is yes, you do not lose points. If the answer is no, you lose the cut total between those two numbers in the official placing. Once you have figured out how many points you have dropped, you will subtract that number from fifty. This will result in your final score. Here are some examples to help you understand.

Example 1

Official Placing: 3-2-4-1 **Cuts:** 7-2-5

If you placed the class 2-3-1-4, your score would be figured as follows:

Placing	Your Answer	Points deducted
Is 2 over 3?	NO	-7
Is 2 over 1?	YES	
Is 2 over 4?	YES	
Is 3 over 1?	YES	
Is 3 over 4?	YES	
Is 1 over 4?	NO	-5
Score: 50 - 12 = 38		

Example 2

Official Placing: 3-2-4-1 **Cuts:** 7-2-5

If you placed the class 4-3-1-2, your score would be figured as follows:

Placing	Your Answer	Points deducted
Is 4 over 3?	NO	-7, -2
Is 4 over 1?	YES	
Is 4 over 2?	NO	-2
Is 3 over 1?	YES	
Is 3 over 2?	YES	
Is 1 over 2?	NO	-2, -5
Score: 50 - 18 = 32		

Example 3

Official Placing: 3-2-4-1 **Cuts:** 7-2-5

If you placed the class 1-4-2-3, your score would be figured as follows:

Placing	Your Answer	Points deducted
Is 1 over 4?	NO	-5
Is 1 over 2?	NO	-2, -5
Is 1 over 3?	NO	-7, -2, -5
Is 4 over 2?	NO	-2
Is 4 over 3?	NO	-7, -2
Is 2 over 3?	NO	-7
Score: 50 - 44 = 6		

LINEAR EVALUATION

Linear scoring is another tool that can be used to evaluate the functional soundness of dairy cattle. With this type of evaluation, a specific numerical value (on a scale of 1 to 50) is assigned to each of 17 different traits. It is important to note that 50 is not the ideal score for every trait. For some traits (called "two-way" traits), such as Rear Legs – Side View and Rump Angle, an intermediate score of 25 is considered ideal. For example, when considering Rear Legs – Side View, a cow with a very posty leg would be given a score of 1, and a cow with an extremely sickle leg would be given a score of 50. Since we prefer an animal that has an intermediate set to her hock, a cow with an ideal leg set would be given a score of 25.

Activity: Look at the pictures on the next two pages, and list what the ideal score would be for each trait: *(answers found on page 51)*

Traits where the ideal score would be 25:

1. _____
2. _____
3. _____
4. _____
5. _____

See Page 47 for a Practice Linear Evaluation Score Sheet

Traits where the ideal score would be 50:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Final Score

In the Holstein classification system, a cow's final score is based on the five major classification categories (or breakdowns as they are also called). Linear evaluators numerically score each category on a scale of 1 to 100, based on how similar they are to the True Type Model cow. The final score is a sum of the five major breakdowns, weighted as follows:

COWS	
Front End/Capacity	20%
Dairy Strength	20%
Rump	5%
Feet & Legs	15%
Udder	40%

BULLS	
Front End/Capacity	40%
Dairy Strength	25%
Rump	10%
Feet & Legs	25%

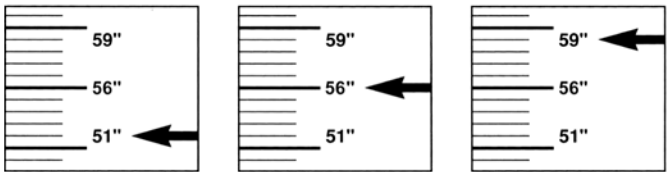
In assigning major breakdown scores, the linear evaluator should consider factors such as age, number of lactations and stage of lactation. The numerical score of the for Final Score breaks down into the following categories:

Excellent (EX)	90-97 points
Very Good (VG)	85-89 points
Good Plus (GP)	80-84 points
Good (G)	75-79 points
Fair (F)	65-74 points
Poor (P)	50-64 points

Linear Descriptive Traits

Here are guidelines for the appropriate point values that should be given to the variations of the traits:

STATURE - ST

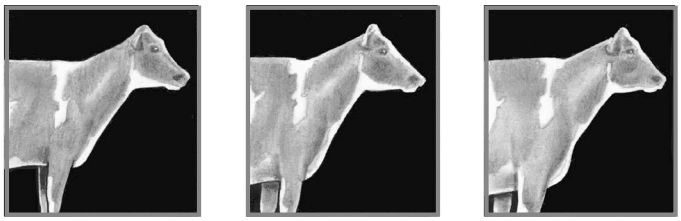


1-5 pts.
Extremely short

25 pts.
Intermediate

45-50 pts.
Extremely tall

STRENGTH - SR



1-5 pts.
Extremely narrow and frail

25 pts.
Intermediate

45-50 pts.
Extremely strong & wide

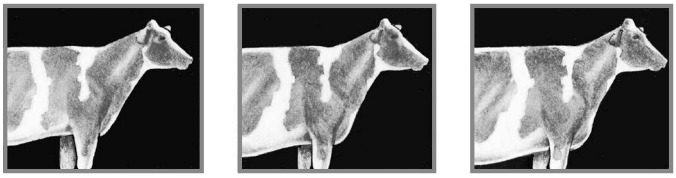
RUMP WIDTH - RW

1 pt. = 2"
Extremely narrow

25 pts. = 4-1/2"
Intermediate width

50 pts. = 7"
Extremely open

BODY DEPTH - BD

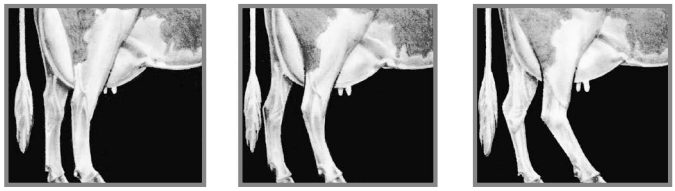


1-5 pts.
Extremely shallow body

25 pts.
Intermediate

45-50 pts.
Extremely deep body

REAR LEGS, SIDE VIEW - LS

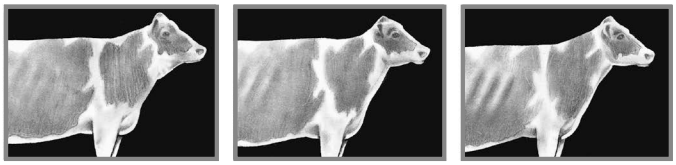


1-5 pts.
Posty and straight

25 pts.
Intermediate set in hock

45-50 pts.
Extremely sickled

DAIRY FORM - DF



1-5 pts.
Extremely tight

25 pts.
Intermediate

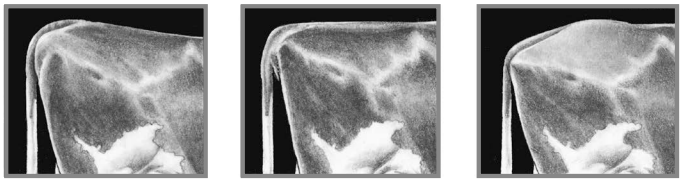
45-50 pts.
Extremely open

REAR LEGS, REAR VIEW - RL

1-5 pts.
Severe toe-out

45-50 pts.
No toe-out

RUMP ANGLE - RA



1-5 pts.
Pins clearly higher than hooks

25 pts.
Slight slope from hooks to pins

45-50 pts.
Extremely sloped from hooks to pins

FOOT ANGLE - FA

1-5 pts.
Extreme low angle

25 pts.
Intermediate angle

45-50 pts.
Extremely steep angle

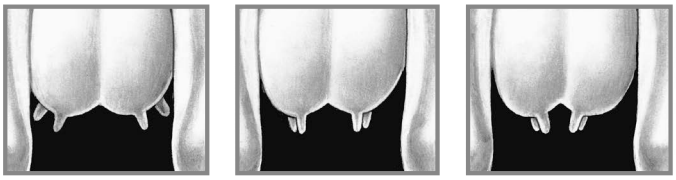
FORE UDDER ATTACHMENT - FU

1-5 pts.
Extremely loose

25 pts.
Intermediate strength

45-50 pts.
Extremely snug & strong

FRONT TEAT PLACEMENT - TP



1-5 pts.
Extremely wide placement on outside of quarter

25 pts.
Centrally placed on quarter

45-50 pts.
Base of teats on extreme inside of quarter

REAR UDDER, HEIGHT - UH

1-5 pts.
Extremely low

25 pts.
Intermediate height

45-50 pts.
Extremely high

TEAT LENGTH - TL

1-5 pts.
1-1/4 inches or smaller

25 pts.
2-1/4 inches

45-50 pts.
3-1/4 inches or longer

REAR UDDER, WIDTH - UW

1-5 pts.
Narrow rear udder

25 pts.
Intermediate width

45-50 pts.
Extremely wide rear udder

UDDER CLEFT - UC

1-5 pts.
Weak cleft

25 pts.
Intermediate

45-50 pts.
Extremely strong cleft

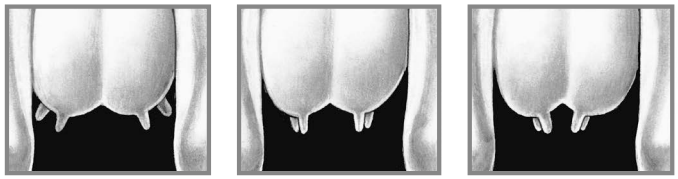
UDDER DEPTH - UD

1-5 pts.
Very deep udder floor well below hocks

25 pts.
Udder floor above hocks

45-50 pts.
Extreme height of udder floor above hocks

REAR TEAT PLACEMENT - RT

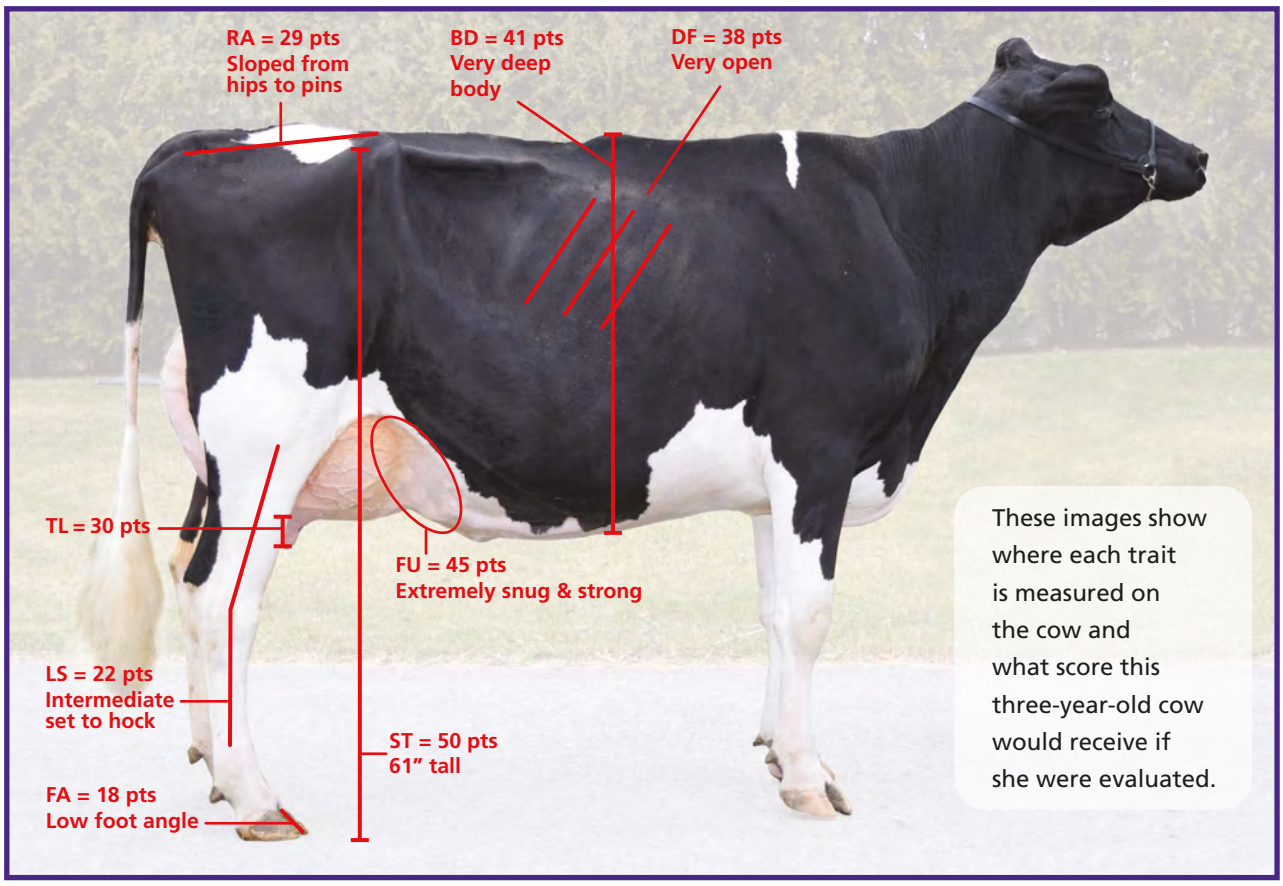


1-5 pts.
Extremely wide placement on outside of quarter

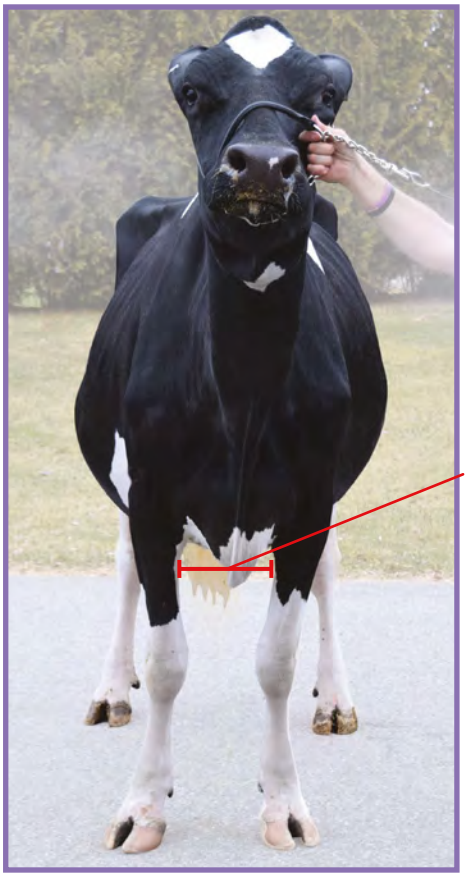
25 pts.
Centrally placed on quarter

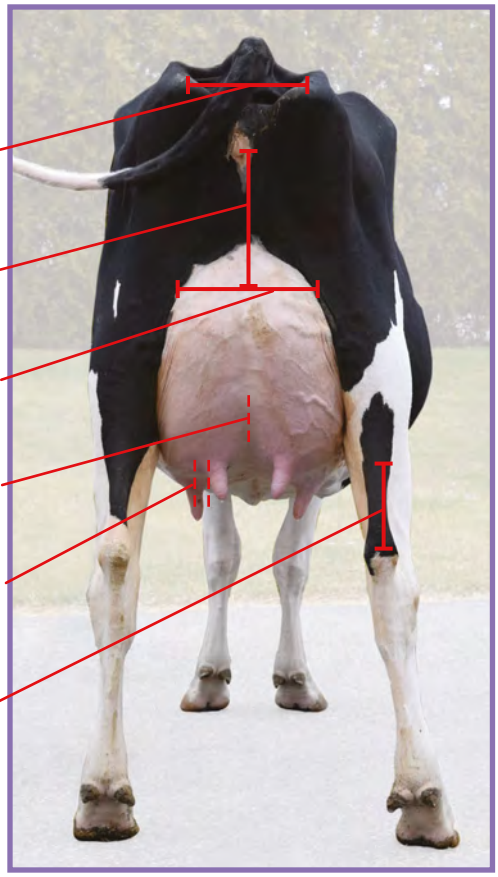
40-45 pts.
Base of teats on extreme inside of quarter

Example Classification

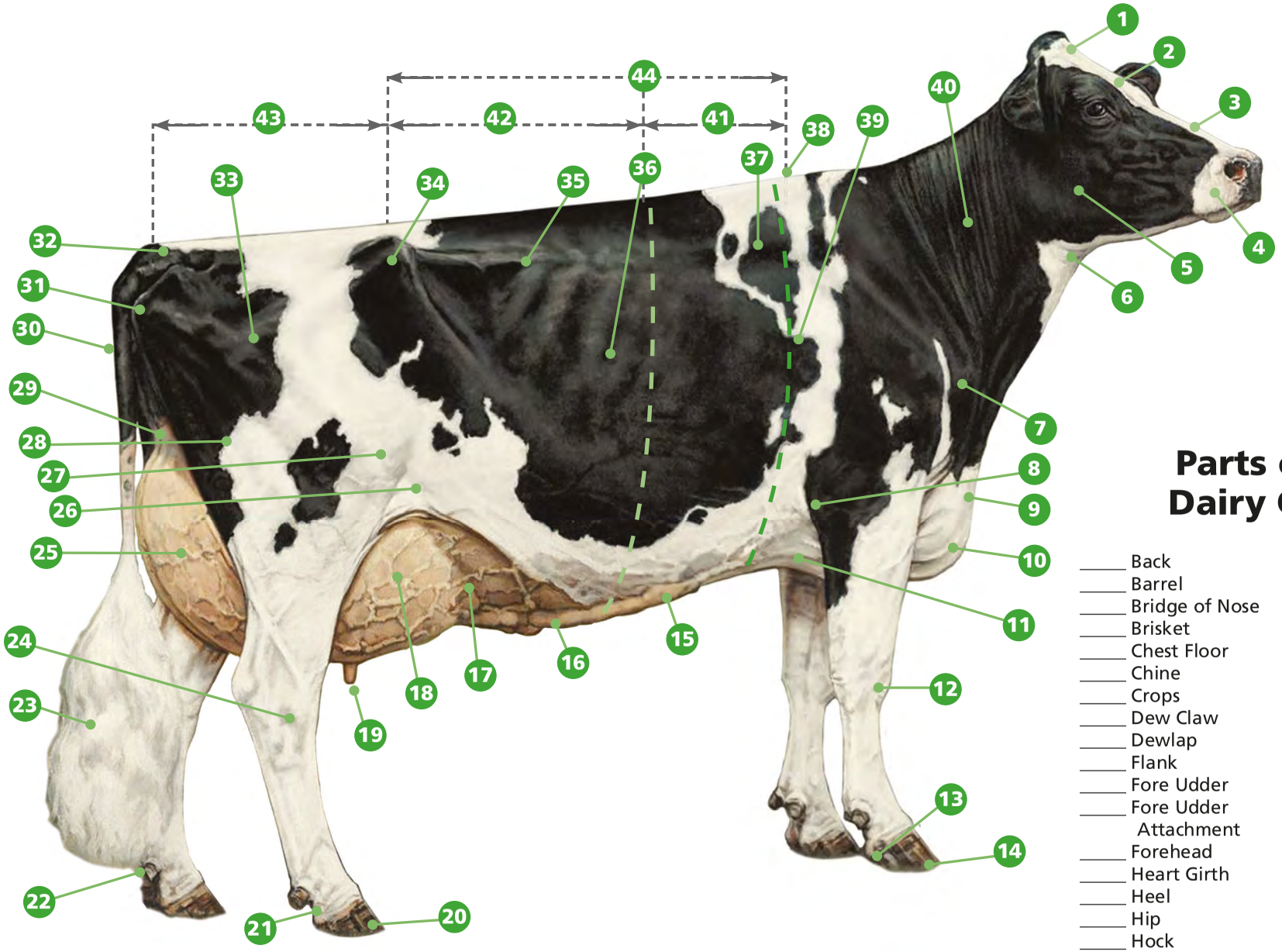


These images show where each trait is measured on the cow and what score this three-year-old cow would receive if she were evaluated.





Practice Activities & Coaches Resources



Parts of a Dairy Cow

_____ Back
_____ Barrel
_____ Bridge of Nose
_____ Brisket
_____ Chest Floor
_____ Chine
_____ Crops
_____ Dew Claw
_____ Dewlap
_____ Flank
_____ Fore Udder
_____ Fore Udder Attachment
_____ Forehead
_____ Heart Girth
_____ Heel
_____ Hip
_____ Hock
_____ Hoof
_____ Jaw
_____ Knee
_____ Loin
_____ Mammary Veins
_____ Milk Wells
_____ Muzzle
_____ Neck
_____ Pastern
_____ Pin Bones
_____ Point of Elbow
_____ Point of Shoulder
_____ Poll
_____ Rear Udder
_____ Rear Udder Attachment
_____ Ribs
_____ Rump
_____ Sole
_____ Stifle
_____ Switch
_____ Tail
_____ Tail Head
_____ Teats
_____ Thigh
_____ Throat
_____ Thurl
_____ Withers

Activity: Parts of a Cow

Label all of the parts of the cow.
To check your answers, see page 51.

What's Your Favorite Term?

The beauty of putting together and delivering a set of reasons is that there are many different ways to describe animals and their characteristics. You shouldn't have to use the same phrase twice in one set. It is important to develop a strong vocabulary of terms to use in your reasons. Once you have your "term library" developed, you will find that your reasons come together much more easily.

Use this worksheet to record a few of your favorite positive ways to describe the traits listed. If you need some ideas, see the section on Terminology, beginning on page 9. Once you get comfortable using the terms you list below, challenge yourself to expand your vocabulary even more!

Dairyness/Dairy Character

1. _____

2. _____

3. _____

Other udder terms

1. _____

2. _____

3. _____

Fore Udder

1. _____

2. _____

3. _____

Feet & Legs

1. _____

2. _____

3. _____

Rear Udder

1. _____

2. _____

3. _____

Body Capacity

1. _____

2. _____

3. _____

Teats

1. _____

2. _____

3. _____

Other general terms that you like

1. _____

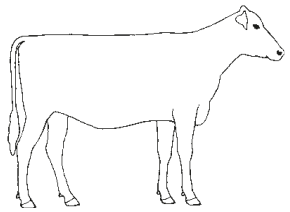
2. _____

3. _____

Share your favorite terms with your teammates and practice using them in an example. Find two cows that show what you are talking about. Practice saying the terms so that you feel comfortable and confident in using them, and try to incorporate a few of your newly learned terms into your next set of reasons. Make it a goal to try to incorporate a new term into each judging practice or set of reasons you give. Before you know it, you will have developed an impressive dairy judging vocabulary.

Placing Cards

Placing Card



Contestant Name

_____

Class #

_____

Class

_____

Breed

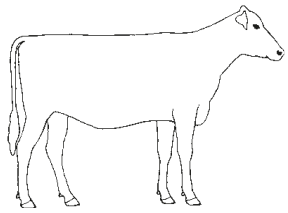
_____

Score

_____

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

Placing Card



Contestant Name

_____

Class #

_____

Class

_____

Breed

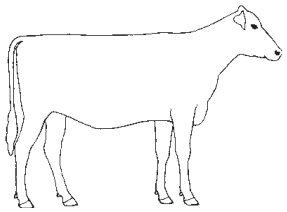
_____

Score

_____

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

Placing Card



Contestant Name

_____

Class #

_____

Class

_____

Breed

_____

Score

_____

1234	
1243	
1324	
1342	
1423	
1432	
2134	
2143	
2314	
2341	
2413	
2431	
3124	
3142	
3214	
3241	
3412	
3421	
4123	
4132	
4213	
4231	
4312	
4321	

Beginners' Reasons Worksheet

Use this worksheet to help you develop a template for giving reasons. Once you get a style down for taking notes, you can duplicate this template in any notebook you use to make notes on a class.

Breed: _____ **Age of Class:** _____

Your Placing: _____ _____ _____ _____

In my top placing, _____ places over _____ because:

1. _____
2. _____
3. _____

(Grant) I will admit that _____:

1. _____

Next, in my middle placing, _____ places over _____ because:

1. _____
2. _____
3. _____

(Grant) I do realize that _____:

1. _____

Finally, in my bottom placing, _____ places over _____ because:

1. _____
2. _____
3. _____

(Reasons for placing bottom cow last) I realize that _____ is

1. _____

I feel that she lacks:

1. _____
2. _____

…to earn a higher placing.

Note-Taking Worksheet

Use this worksheet to help you develop a note-taking template for your reasons. Once you get a style that works for you, this can be easily re-created in any notebook you use to take notes on a class.

Breed: _____ **First Impression:** _____ _____ _____ _____

Age: _____ **Final Placing:** _____ _____ _____ _____

1 1. _____ 2. _____ 3. _____	_____ / _____ 1. _____ 2. _____ 3. _____ Grant _____
2 1. _____ 2. _____ 3. _____	_____ / _____ 1. _____ 2. _____ 3. _____ Grant _____
3 1. _____ 2. _____ 3. _____	_____ / _____ 1. _____ 2. _____ 3. _____ Grant _____
4 1. _____ 2. _____ 3. _____	Leave _____ last Admire _____ 1. _____ leave last because 1. _____

Name: _____

Practice Linear Evaluation Score Sheet

Use this sheet to practice assigning linear scores to animals. It is a good idea to learn the abbreviations for the different traits listed so that during a contest you don't get confused by the abbreviations. See the next page for a guide to scoring each trait.

Linear Traits																	
Animal Identification	**ST**	**SR**	**BD**	**DF**	**RA**	**RW**	**LS**	**RL**	**FA**	**FU**	**UH**	**UW**	**UC**	**UD**	**TP**	**TL**	**RT**	**Final Score**

Example of linear contest scoring:

Since linear scoring involves assigning exact numbers for each trait, a small margin of error is often given to contestants for their scores of each trait. The following is an example of how a linear contest might be scored:

Contestant's score is within 2 points of the official score: 5 points for each trait
Contestant's score is within 5 points of the official score: 2.5 points for each trait
Contestant is more than 5 points+/- of the official score: 0 points for each trait

Linear Descriptive Traits

FORM

Stature (ST)

50 ----------
45 - Extremely Tall 58-60”
40 ----------
35 - Tall
30
25 - Intermediate ----------55”
20
15 - Short
10 ----------
5 - Extremely Short 50 – 52”
1 ----------

Strength (SR)

50
45 - Extremely Strong and Wide
40
35 - Strong
30
25 - Intermediate
20
15 - Narrow
10
5 - Extremely Narrow
1

Body Depth (BD)

50
45 - Extremely Deep
40
35 - Deep Body
30
25 - Intermediate
20
15 - Shallow
10
5 - Extremely Shallow
1

Dairy Form (DF)

50
45 - Extremely Open
40
35 - Open
30
25 - Intermediate
20
15 - Tight
10
5 - Extremely Tight
1

RUMP

Rump Angle (RA)

50 ---------- 5 1/4”
45 - Extremely Sloped
40 ---------- 3 3/4”
35 - Moderate Slope
30 ---------- 2 1/4”
25 - Slight Slope -------- 1 1/2”
20 ---------- 3/4”
15 - Level Rump
10 ---------- 3/4” high
5 - High Pins
1 ---------- 2 1/4” high

Rump Width (RW)

50 ---------- 7” above
45 - Extremely Wide
40 ---------- 6”
35 - Wide
30 ---------- 5”
25 - Intermediate ------ 4 1/2”
20 ---------- 4”
15 - Slightly Narrow
10 ---------- 3”
5 - Extremely Narrow
1 ---------- 2” below

LEGS AND FEET

Rear Legs, Side View (LS)

50
45 - Extremely Sickled
40
35 - Slightly Sickled
30
25 - Intermediate
20
15 - Slightly Posty
10
5 - Extremely Posty
1

Foot Angle (FA)

50
45 - Extremely Steep
40
35 - Steep
30
25 - Intermediate ---------- 45°
20
15 - Slightly Low
10
5 - Extremely Low
1

UDDER

Fore Udder Attachment (FU)

50
45 - Extremely Strong
40
35 - Strong
30
25 - Intermediate
20
15 - Loose
10
5 - Extremely Loose
1

Rear Udder Height (UH) (Between RU and Vulva)

50 ---------- 7.0”
45 - Extremely High
40 ---------- 8.4”
35 - High
30 ---------- 9.8”
25 - Intermediate-------- 10.5”
20 ---------- 11.2”
15 - Low
10 ---------- 12.6”
5 - Extremely Low
1 ---------- 14.0”

Rear Udder Width (UW)

50 ---------- 8”
45 - Extremely Wide
40 ---------- 7”
35 - Wide
30 ---------- 6”
25 - Intermediate ------- 5 1/2”
20 ---------- 5”
15 - Narrow
10 ---------- 4”
5 - Extremely Narrow
1 ---------- 3”

Udder Cleft (UC)

50 ---------- -- 2 3/4”
45 - Extremely Strong 2 1/2”
40
35 - Strong---------- -- 1 3/4”
30
25 - Intermediate--- -- 1 1/4”
20
15 - Weak---------- -- 3/4”
10
5 - Extremely Weak flat
1 ----------(-1 1/4”)

Udder Depth (UD)

50 ---------- 7”
45 - Extremely Shallow
40 ---------- 5”
35 - Well Above Hock
30 ---------- 3”
25 - Intermediate------- 2”
20
15- Udder Floor at Hock even
10
5 - Extremely Deep --(-2”)
1 ----------(-3”)

TEATS

Front Teat Placement (TP)

50
45 - Extremely Close
40
35 - Close
30
25 - Centrally Placed
20
15 - Wide
10
5 - Extremely Wide
1

Teat Length (TL)

50 ---------- 3 1/2”
45 - Extremely Long
40 ---------- 3”
35 - Long
30 ---------- 2 1/2”
25 - Intermediate --------- 2 1/4”
20 ---------- 2”
15 - Short
10 ---------- 1 1/2”
5 - Extremely Short
1 ---------- 1”

RESEARCH TRAITS

Rear Legs, Rear View (RL)

50
45 - Tracks Extremely Straight
40
35 - Nearly Straight
30
25 - Slight Hock-In
20
15 - Definite Hock-In
10
5 - Extreme Hock-In
1

Udder Tilt (UT)

50 ---------- 2”
45 - Extreme Forward Tilt
40 ---------- 1”
35 - Slight Forward Tilt
30 ---------- level
25 - Nearly Level---------- 1/2”
20 ---------- 1”
15 - Rearward Tilt
10 ---------- 2”
5 - Extreme Rearward Tilt
1 ---------- 3”

MAJOR BREAKDOWN AND FINAL SCORE BRACKETS

Major Breakdown	Excellent	(E)	90-100 Points	**Final Score**	Excellent	90-97 Points
	Very Good	(V)	85-89		Very Good	85-89
	Good Plus	(+)	80-84		Good Plus	80-84
	Good	(G)	75-79		Good	75-79
	Fair	(F)	65-74		Fair	65-74
	Poor	(P)	1-64		Poor	50-64

			FEMALES	MALES
Major Breakdowns and Weightings	FR:	Frame	15%	30%
	DC:	Dairy Character	20%	25%
	BC:	Body Capacity	10%	20%
	FL;	Feet and Legs	15%	25%
	UD:	Udder	40%	
	FS:	Final Score		

Source: University of Wisconsin-Madison (www.uwex.edu/ces/dairyyouth/nonhtml/linear.pdf)

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Full name, as you would like to be recognized for your gift:

_____

Address _____

City _____ State _____ Zip Code _____

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Brattleboro, VT 05302-0816

With questions, contact Jodi Hoynoski at 800.952.5200, ext. 4261 or jhoynoski@holstein.com.

Answer Key for Activity Sheets

Linear Activity from Page 37

Traits where the ideal score would be 25

1. Rear Legs, Side View
2. Rump Angle
3. Front Teat Placement
4. Teat Length
5. Rear Teat Placement

Traits where the ideal score would be 50

1. Stature
2. Strength
3. Rump Width
4. Body Depth
5. Dairy Form
6. Rear Legs, Rear View
7. Foot Angle
8. Fore Udder Attachment
9. Rear Udder Height
10. Rear Udder Width
11. Udder Cleft
12. Udder Depth

Parts of a Dairy Cow from Page 42

44 Back
36 Barrel
3 Bridge of Nose
10 Brisket
11 Chest Floor
41 Chine
37 Crops
22 Dew Claw
9 Dewlap
26 Flank
18 Fore Udder
17 Fore Udder Attachment
2 Forehead
39 Heart Girth
13 Heel
34 Hip
24 Hock
20 Hoof
5 Jaw
12 Knee
42 Loin
16 Mammary Veins
15 Milk Wells
4 Muzzle
40 Neck
21 Pastern
31 Pin Bones
8 Point of Elbow
7 Point of Shoulder
1 Poll
25 Rear Udder
29 Rear Udder Attachment
35 Ribs
43 Rump
14 Sole
27 Stifle
23 Switch
30 Tail
32 Tail Head
19 Teats
28 Thigh
6 Throat
33 Thurl
38 Withers

Holstein Foundation Dairy Judging Workbook (vol. 3)
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Holstein Foundation *Dairy Judging Workbook*, vol. 1. 2006.

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University of Wisconsin-Madison Dairy Judging Linear Descriptive Traits Worksheet. Web. <http://www.uwex.edu/ces/dairyyouth/old/nonhtml/linear.pdf>.

Cow Skeleton Clipart. 2009. Florida Educational Technology Clearinghouse. Florida Center for Instructional Technology. <http://etc.usf.edu/clipart/12300/12383/skeletoncow_12383.htm>.

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