Lesson 3: Principles of Dairy Cattle Selection

Dairy producers face a major task when selecting replacement heifers and choosing which cows in the current herd to keep or to sell. Maximizing milk production is the primary goal of dairy producers. When a producer selects females for his or her herd, the decision may affect the operation's long-term success in the dairy industry because of the longevity and genetic influence of the dairy cow and her offspring.

Parts of a Dairy Cow

When describing dairy cattle, proper terminology is essential to be able to communicate properly with other individuals involved in the dairy industry. Figure 3.1 is an illustration of the parts of a dairy cow.

Dairy Cow Unified Score Card

The dairy breed associations and dairy producers developed the Dairy Cow Unified Score Card (Figure 3.2) in the 1940s. The dairy score card has been revised often, most recently in 1994. Producers should use the score card to help evaluate and select cows for production. It compares cows to an ideal cow, which is given a score of 100 points; they are then classified according to their scores. The classifications are as follows:

Excellent	90-100 points
Very Good	85-89 points
Good Plus	80-84 points
Good	75-79 points
Fair	70-74 points
Poor	Less than 70 points

The Dairy Cow Unified Score Card looks at five major traits for classification. These traits are frame, dairy character, body capacity, feet and legs, and udder.

Frame (15 points) - The skeletal parts of the cow, except the feet and legs, are evaluated in this category. Dairy cattle should be tall and long-bodied with a straight, strong back; a long, level rump; and a long, clean neck.

Figure 3.1 - Parts of a Dairy Cow

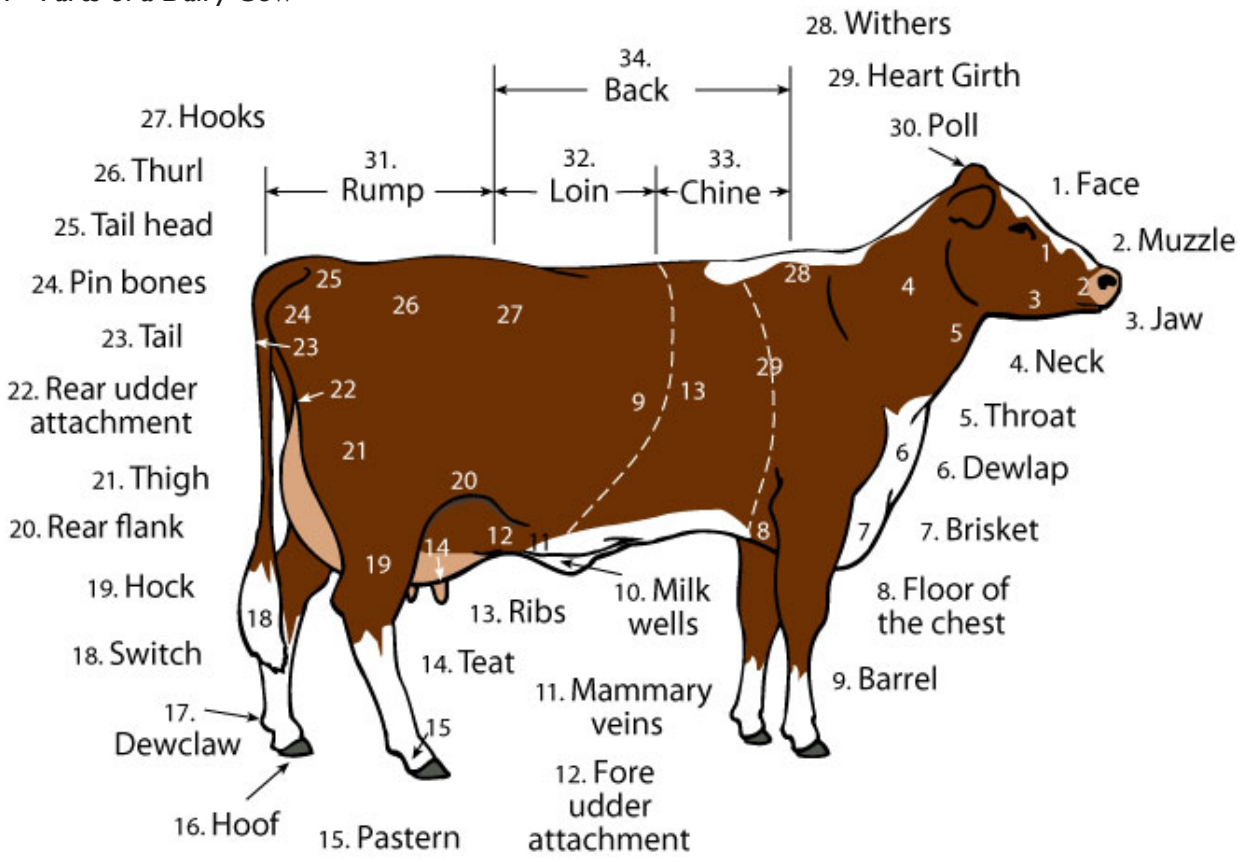


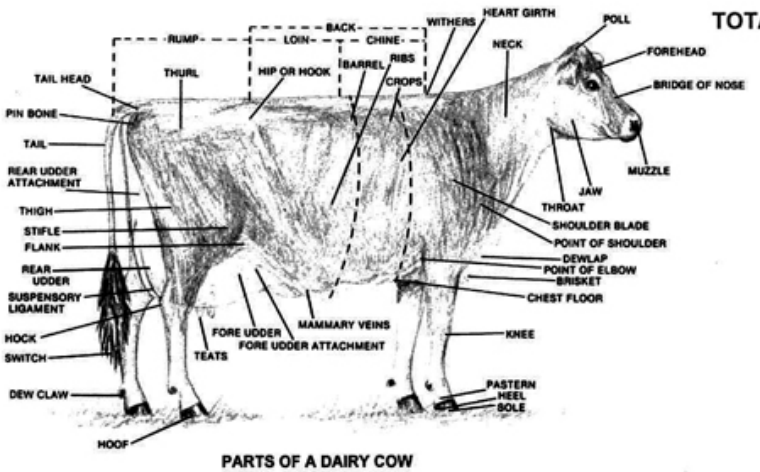
Figure 3.2 - Dairy Cow Unified Score Card

DAIRY COW UNIFIED SCORE CARD

Breed characteristics should be considered in the application of this score card

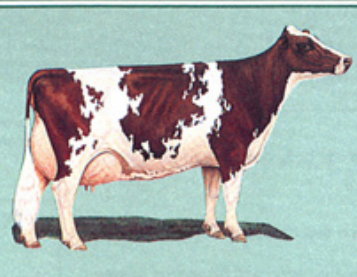
MAJOR TRAIT DESCRIPTIONS

	Perfect Score
There are five major classification traits on which a classifier bases a cow's score. Each trait is broken down into body parts to be looked at and ranked.	
1) Frame - 15% The skeletal parts of the cow, with the exception of feet and legs, are evaluated. Listed in priority order, the descriptions of the traits to be considered are as follows: **Rump** - long and wide throughout with pin bones slightly lower than hip bones. Thurls need to be wide apart and centrally placed between hip bones and pin bones. The tailhead is set slightly above and neatly between pin bones, and the tail is free from coarseness. The vulva is nearly vertical. **Stature** - height, including length in the leg bones. A long bone pattern throughout the body structure is desirable. Height at the withers and hips should be relatively proportionate. **Front End** - adequate constitution with front legs straight, wide apart and squarely placed. Shoulder blades and elbows need to be firmly set against the chest wall. The crops should have adequate fullness. **Back** - straight and strong; the loin - broad, strong, and nearly level. **Breed Characteristics** - overall style and balance. Head should be feminine, clean-cut, slightly dished with broad muzzle, large open nostrils and a strong jaw is desirable. Rump, Stature, and Front End receive primary consideration when evaluating Frame.	15
2) Dairy Character - 20% The physical evidence of milking ability is evaluated. Major consideration is given to general openness and angularity while maintaining strength, flatness of bone and freedom from coarseness. Consideration is given to stage of lactation. Listed in priority order, the descriptions of the traits to be considered are as follows: **Ribs** - wide apart. Rib bones are wide, flat, deep, and slanted toward the rear. **Thighs** - lean, incurving to flat, and wide apart from the rear. **Withers** - sharp with the chine prominent. **Neck** - long, lean, and blending smoothly into shoulders. A clean-cut throat, dewlap, and brisket are desirable. **Skin** - thin, loose, and pliable.	20
3) Body Capacity - 10% The volumetric measurement of the capacity of the cow (length x depth x width) is evaluated with age taken into consideration. Listed in priority order the descriptions of the traits to be considered are as follows: **Barrel** - long, deep, and wide. Depth and spring of rib increase toward the rear with a deep flank. **Chest** - deep and wide floor with well-sprung fore ribs blending into the shoulders. The Barrel receives primary consideration when evaluating Body Capacity.	10
4) Feet and Legs - 15% 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: **Feet** - steep angle and deep heel with short, well-rounded closed toes. **Rear Legs**: **Rear View** - straight, wide apart with feet squarely placed. **Side View** - a moderate set (angle) to the hock. **Hocks** - cleanly molded, free from coarseness and puffiness with adequate flexibility. **Pasterns** - short and strong with some flexibility. Slightly more emphasis placed on Feet than on Rear Legs when evaluating this breakdown.	15
5) Udder - 40% The udder traits are the most heavily weighted. 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** - moderate depth relative to the hock with adequate capacity and clearance. Consideration is given to lactation number and age. **Teat Placement** - squarely placed under each quarter, plumb and properly spaced from side and rear views. **Rear Udder** - wide and high, firmly attached with uniform width from top to bottom and slightly rounded to udder floor. **Udder Cleft** - evidence of a strong suspensory ligament indicated by adequately defined halving. **Fore Udder** - firmly attached with moderate length and ample capacity. **Teats** - cylindrical shape and uniform size with medium length and diameter. **Udder Balance and Texture** - should exhibit an udder floor that is level as viewed from the side. Quarters should be evenly balanced; soft, pliable and well collapsed after milking.	40
	TOTAL 100

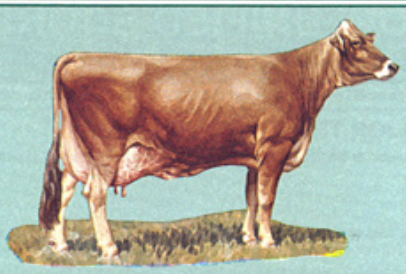


PARTS OF A DAIRY COW

Courtesy of the Purebred Dairy Cattle Association.



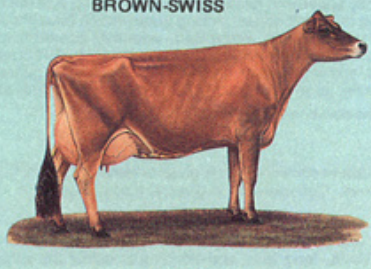
AYRSHIRE



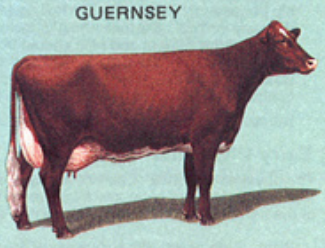
BROWN-SWISS

GUERNSEY

HOLSTEIN-FRIESIAN



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.

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 a minimum of 1500 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 moderatly 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 should weigh 1400 lbs.

BROWN SWISS

Strong and vigorous, but not coarse. Size and ruggedness with quality desired. Extreme refinement 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-solid brown varying from very light to dark. Muzzle is black encircled by a mealy colored ring, and the tongue, switch and hooves are black

SIZE-a mature cow in milk should weigh 1500 lbs.

GUERNSEY

Size and strength, 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-a shade of fawn with white markings throughout clearly defined. When other points are equal, clear (buff) muzzle will be favored over a smoky or black muzzle.

SIZE-a mature cow in milk should weigh at least 1150 lbs.

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, and the tongue and switch may be either white or black.

SIZE-a mature cow in milk should weigh about 900 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 the judge, based on the guide for discrimination and disqualifications given below.

HORNS
No discrimination for horns.

EYES
1. Blindness 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.*

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

CAPPED HIP
No discrimination unless effects mobility.

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 having: *Slight to serious discrimination.*
2. Udder definately 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 SIZE
Slight to serious discrimination.

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 usefullness: *Slight to serious discrimination.*

OVERCONDITIONED
Slight to serious discrimination.

FREEMARTIN HEIFERS
Disqualification.

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Dairy character (20 points) - Dairy character provides a prediction of future milk production through the evaluation of milking ability. Dairy cattle should have wide, flat ribs and be lean in appearance, with sharp withers.

Body capacity (10 points) - Body capacity is an evaluation of the volume of the cow. It determines the amount of feed the animal is able to consume, which affects milk production. Dairy cows should be long, deep, and wide through the barrel and chest floor.

Feet and legs (15 points) - Looking at the feet and legs allows an individual to evaluate skeletal soundness, or the ability of the cow to move easily.

Udder (40 points) - The udder is the most important part of the dairy cow. Udders are evaluated for milk production and productivity over time. The cow's udder size, cleft, balance, and teat placement should be considered.

Linear Evaluation

Linear evaluation is another type of evaluation system in which a computer program is used to score cattle for individual traits. Dairy producers use this information to improve the functional type of the dairy herd by selecting animals for breeding.

Linear classification scores cows on seventeen linear traits by assigning a numerical score between one and fifty. A linear trait is a simple trait that can be scored along a range from one extreme to another. Depending on the specific trait, a high, low, or moderate point value is desirable. The linear traits are:

- stature
- strength
- body depth
- dairy form
- rump angle
- rump width
- rear legs (side view)
- foot angle
- fore udder attachment
- rear udder height
- rear udder width
- udder cleft
- udder depth
- front teat placement
- teat length
- rear legs (rear view)
- udder tilt

Linear evaluation and classification allows producers to pinpoint specific traits in cows that should be improved and then select bulls for breeding. They can also evaluate and select bulls for breeding by using their daughters' scores. Future generations of replacements will be sounder and more productive.

Summary

To help in evaluating animals, producers must know the correct names of the parts of a dairy cow. The Dairy Cow Unified Score Card is one method of evaluating dairy cows for selection. Linear evaluation is a more trait-specific approach for selecting dairy animals for breeding.

Credits

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