



Holstein Association USA

## Learning linear evaluation

Linear evaluation is a tool that describes the cow. The scorecard is a basis of comparison to the ideal.

by Ted Halbach

**F**OR most dairy judging beginners, those first few practices focus on learning the parts of the dairy cow. Once that is mastered, most coaches then introduce potential judging team members to the Purebred Dairy Cattle Association (PDCA) Dairy Cow Unified Scorecard and begin teaching how to apply its standards. In



### HALBACH

The author is a dairy management instructor at the University of Wisconsin-Madison. He has coached three national championship intercollegiate dairy cattle judging teams.

working with my students, I have found that an intermediate step, teaching them linear evaluation, is an effective tool. Linear evaluation helps illustrate the standard points of measurement, the biological range of traits and what the desirable measurements are.

### What is linear evaluation?

Linear evaluation uses a 50-point scale, with each trait ranging from 1 to 50. Linear type traits serve as the basis of all modern

type classification systems. These traits allow us to describe the cow in detail based on a defined scale for each trait. In fact, approximately 85 percent of the PDCA Scorecard can be accounted for by the linear traits. In the U.S., 18 different linear traits are evaluated. To qualify as a linear trait, the trait must meet these standards:

- Traits are scored individually
- Scores cover a biological range
- Variation within traits is identifiable
- Degree rather than desirability is recorded
- Possible to measure instead of score
- Economically important
- Heritable

Ultimately, dairy judging is based on your ability to apply the PDCA Scorecard to evaluate individual animals to the concept of true type or perfection. Thus, a key difference in linear evaluation and the scorecard is that linear is an evaluation tool which describes the cow versus the scorecard that provides for a basis of comparison to ideal conformation.

### Comparing scorecard and linear

To help understand each of the scorecard's major breakdowns, we will be using linear evaluation to show you the biological range of these traits in the Holstein population and

how to apply the linear scale.

The PDCA Scorecard has four major breakdowns, and each of those is weighted according to their importance. The four breakdowns are:

- Udder at 40 percent
- Dairy strength at 25 percent
- Rear feet and legs at 20 percent
- Frame at 15 percent

Within the point breakdowns on the scorecard, 15 points are accounted for by nonlinear traits. These will be noted below.

**Frame, at 15 percent**, considers the skeletal parts of the cow, with the exception of rear feet and legs. The related linear traits (listed in priority order of the PDCA Scorecard) include: rump angle and rump width (5 points) and stature (2 points).

In the frame portion of the scorecard, the nonlinearized traits are front end (5 points) back/loin (2 points) and breed characteristics (1 point).

**Rear feet and legs account for 20 percent** of the breakdown. In this category, evidence of mobility is given major consideration. The related linear traits include: locomotion (5 points), rear legs-rear view (3 points), rear legs-side view (3 points) and foot angle (3 points).

The nonlinear traits are thurl position (2 points), hocks (2 points), bone (1 point) and pasterns (1 point).

**At 25 percent, dairy strength** is a combination of dairyness and strength that supports sustained milk 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 the stage of lactation. The related linear traits include: dairy form (15 points combining the ribs, thighs, neck, withers and skin), strength (6 points) and body depth (4 points).

Rounding out the four categories is **udder, at 40 percent**. Major consideration is given to the traits that contribute to high milk yield and a long productive life. The related linear traits include: udder depth (10 points), rear udder height and width (9 points), front and rear teat placement (5 points), udder cleft (5 points), fore udder attachment (5 points), teat length (3 points) and udder tilt (3 points).

*Hoard's Dairyman* is indebted to a host of editorial staff and industry specialists who assisted with preparing and picturing the cows, which took place over five days. The majority of cattle were generously provided by Ran-Rose Dairy, with others coming from the UW Research herd, Mark and Nicky Rueth, and Mitch Krahn. Photos for the series were taken by Beth Herges, Madison, Wis., and Jerome Meyer, a Holstein classifier, reviewed the linear scores. 🐄

**OVER TWO DAYS**, the majority of the cows in the series were pictured at Ran-Rose Dairy. The crew there included, Front row (L to R): Josh Krahn, herdsman at Ran-Rose Dairy; Patti Hurtgen, *Hoard's Dairyman*; Corey Geiger, *Hoard's Dairyman*; Luke Lensmire, dairy cattle fitter; and Ben Kinnard, project assistant. Back row (L to R): Beth Herges, photographer; Amanda Smith, *Hoard's Dairyman*; Ted Halbach, UW-Madison; and Jonas Melbaum, dairy cattle fitter. Also assisting with the project was dairy cattle fitter Ryan Krohlow.



In this series of articles, we will feature one breakdown per issue and the linear traits associated with it:

- January 10:** Learning linear evaluation
- January 25:** Analyzing the frame
- February 10:** Analyzing dairy strength
- February 25:** Analyzing rear feet and legs
- March 10:** Analyzing the udder