LINEAR SCORING
ANALYZING THE FRAME

by Ted Halbach

THE Frame (15 points on the PDCA Scorecard) represents all the skeletal parts of the cow, with the exception of rear feet and legs. Think of the Frame as a silhouette or outline of the cow. The linear traits within Frame include Rump Angle and Rump Width, and Stature.

Since the rump (5 points) forms the framework

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for the udder, it is ideally long and wide with a slight slope from hips to pins. This allows plenty of capacity for a high and wide rear udder and length for the median suspensory ligament to attach to the pelvic floor. A wide, correctly sloped rump also aids fertility allowing easier passage for the calf at birth and necessary drainage of postcalving fluids. In addition, correct rump structure supports breeding and reproductive efficiency.

An ideal **Rump Angle** is when the pins are slightly lower than the hips, or a slightly sloped rump. The definition of slight slope is when the top of the pins are 1-1/2 inches below the top of the hips. Rump Angle is an objective trait, as you can measure the distance the pins are above or below the hips. A rump that is level scores a 15. The ideal slope of 1-1/2 inches receives a 25. When the pins are higher than the hips, the score

is lower than 15. When the rump is extremely sloped, the score is higher than 25. For example, if the pins are 4-1/2 inches lower than the hips, the assigned score is a 45.

Rump Width is measured from the inside points of the pin bones. Rump Width, too, is an objective trait. A 25 on the linear scale would be a rump that is 4-1/2 inches wide between the pins. A wider rump (6-1/2 inches) between the pins would score a 45, and a narrower rump that is 2-1/2 inches wide would score a 5. You would want to discriminate against narrow rumps.

The next linearized trait in the Frame breakdown is **Stature** (2 points). We use Stature to describe a cow's height, measured from the top of the spine in between her hips to the ground. Stature is another objective trait, so specific measurements have specific linear scores. A Holstein cow that is 56 inches tall at the hips would score a 25 on the linear scale. Every inch above or below 56 inches would be a 5-point change in linear score. So, a cow that is 57 inches tall would have a linear score of 30, or a cow that is 60 inches tall would score a 45. Any cows taller than 61 inches would receive a score of 50.

Tall cows usually carry their udders higher above the ground putting them at less risk of teat or udder injury. Stature, though, is a highly heritable trait and in recent years has proven to be problematic as cows on many farms have outgrown stall sizes that were adequate just a decade ago. Because of this, the Holstein Association recently changed stature for first-lactation cows to be evaluated as a two-way trait with an intermediate optimum. The ideal height for a first-lactation Holstein cow is 56 inches (a linear score of 25) with an acceptable range of 53 to 59 inches.
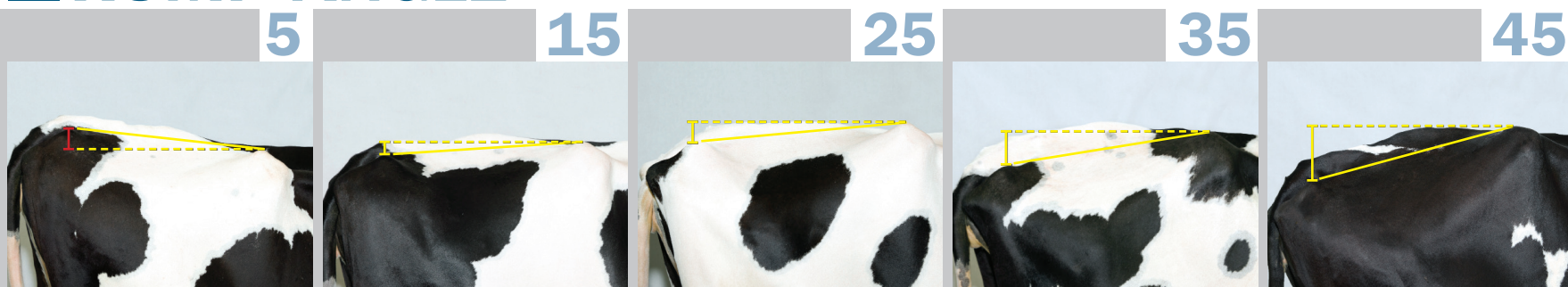
STATURE

Linear*	5	15	25	35	45
Ayrshire	49	51	53	55	57
Brown Swiss	52	54	56	58	60
Guernsey	51	53	55	57	59
Holstein	52	54	56	58	60
Jersey	45	47	49	51	53
Milking Shorthorn	51	53	55	57	59

*Ayrshire measured at shoulder, all others measured at hips. Jersey uses a 1 to 80 scale. At 80, a cow is 60 inches.

RUMP ANGLE

5   15   25   35   45

RUMP WIDTH

5   15   25   35   45

YOUNG DAIRYMEN