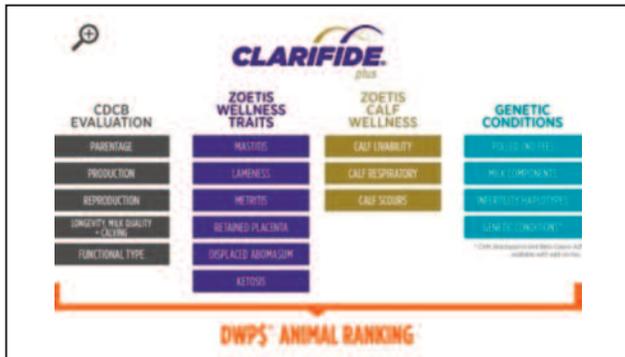




# UNDERSTANDING VARIOUS TRAITS

## WELLNESS TRAITS & DWPS



The **Dairy Wellness Profit Index™ (DWPS®)** includes production, fertility, type, longevity, calving ability, milk quality, the dairy wellness traits, and Polled test results. Combining Wellness Traits with traits used to calculate Net Merit (NM\$), DWPS® estimates the potential profit contribution an animal will pass along to the next generation.

The **Wellness Trait Index™ (WT\$)** estimates the difference in expected lifetime profit associated with the risk of diseases in cows. It focuses on the six wellness traits of mastitis, lameness, metritis, retained placenta, ketosis and displaced abomasum, in addition to adding the economic value for the polled gene.

CLARIFIDE® provides reliable assessments of genetic risk factors for economically relevant diseases in Holstein cattle for six wellness traits.

The six wellness traits are:

Dairy Wellness Traits	Label	Ave. Score*	Min.*	Max.*
Mastitis	MAST	100	76	115
Lameness	LAME	100	73	115
Metritis	MET	100	75	115
Retained Placenta	RP	100	71	116
Ketosis	KET	100	72	113
Displaced Abomasum	DA	100	69	111

\* provided by CLARIFIDE® Plus

The **Calf Wellness Index™ (CW\$™)**, estimates the difference in expected lifetime profit with risk of calfhood diseases and early death losses by including calf livability, calf respiratory disease and calf scours.

Calf Wellness Traits	Label	Ave. Score*	Min.*	Max.*
Calf Livability	LIV	100	66	116
Calf Scours	SCOURS	100	85	117
Calf Respiratory Disease	RES	100	83	116

\* provided by CLARIFIDE® Plus

## SIRE SUMMARY TERMINOLOGY

### GENERAL TERMS:

#### PTA: Predicted Transmitting Ability

- M: Milk production in pounds
- F: Fat production in pounds
- F%: Genetic variance for transmitting fat
- P: Protein production in pounds
- P%: Genetic variance for transmitting protein
- Rel: Percent reliability of a sire's proof
- T: Type
- UDC: Udder Composite Index
- FLC: Foot and Leg Composite Index

#### EFI: Effective Future Inbreeding

An estimate based on pedigree of the level of inbreeding the progeny of a given animal will contribute in the population if mated at random.

#### Beta-Casein: A1A1, A1A2 or A2A2

A major casein protein that makes up 30% of total milk protein. Studies have shown health benefits for A2.

#### Kappa-Casein: BB, AB, AA, BE, BE, EE

Research shows a strong association between Kappa-Casein and milk that clots quickly, which yields higher and firmer cheese. BB is the most desirable, then AB and AA is less desirable. Milk with an E allele does not clot to make cheese.

### HEALTH & FERTILITY TRAIT TERMS:

#### FE: Feed Efficiency

The net profit a dairy producer receives from an increase in production. Calculation: Feed Efficiency = (Dollar Value of milk produced) – (Feed costs of extra milk) – (Extra maintenance costs)

#### FSAV: Feed Saved

Expected pounds of feed saved per lactation based on body weight composite (BWC) and residual feed intake (RFI) evaluations. Larger, positive numbers are favorable.

#### DPR: Daughter Pregnancy Rate

A percentage of non-pregnant cows that become pregnant during each 21-day period. DPR considers how quickly cows come back into heat after calving and conception rate when bred. A DPR of +1.0 implies daughters of this bull are 1% more likely to become pregnant during that estrus cycle than a bull with +0.0. DPR ranges from +3.0 to -3.0.

#### PL: Productive Life

Time a cow stays in herd as a "productive" animal. Number represents how many months (additional or fewer, if negative) of lifetime expected.

#### LIV: Cow Livability

A cow's ability to remain alive while in the milking herd.

#### HLIV: Heifer Livability

A heifer's ability to remain alive while in the milking herd.

#### SCS: Somatic Cell Count

A main indicator of milk quality. A lower number indicates better animal health.

#### MS: Milking Speed

Evaluated in terms of the percentage of first lactation daughters as average or fast. A value of 100 indicates average.

#### MT: Milking Temperament

The expected percentage of future daughters that will be average, calm or very calm during their first lactation. A value of 100 indicates average.

# UNDERSTANDING VARIOUS TRAITS

## COMMON HAPLOTYPES & CALVING EASE

### DEFINITIONS:

#### What is a haplotype?

A haplotype is a stretch of chromosome or DNA that is transmitted as a unit from one generation to the next. In our context, we are referring to a set of single-nucleotide polymorphisms (SNPs) on a single chromosome that is inherited together as a unit.

#### Homozygous vs. Heterozygous

Cattle have two versions of each chromosome. One chromosome was inherited from the sire and one was inherited from the dam. Homozygous and heterozygous are used to describe DNA at specific points along the chromosome. Homozygous means the DNA on each chromosome is the same. Heterozygous indicates the DNA on each chromosome is different at a specific site.

### CALVING TRAIT TERMS:

#### SCE: Sire Calving Ease

Percentage of a bull's calves considered difficult when born to a first lactation animal.

#### DCE: Daughter Calving Ease

Measurement of the ability of a cow from a particular sire to calve easily.

As calving traits have been successfully improved, the August 2020 Holstein Calving Ease PTAs were adjusted. They average 2.2% for SCE and 2.7% for DCE. Most Holstein bulls will range from 1% to 4% SCE.

### WHEN POLLED IS DOMINANT

Polled trait or naturally hornless is a dominant trait. The Holstein Association USA identifies Polled animals one of two ways:

PC: Tested Heterozygous Polled

PP: Tested Homozygous Polled

When a heterozygous polled bull (PC) is bred to a horned female, 50% of the offspring are Polled. When a homozygous Polled bull (PP) is bred to a horned female, 100% of the offspring are Polled. Only one parent must have the Polled gene for offspring to be Polled.

### SCURS

Scurs are undeveloped horns that are usually blunt and rounded at the end and short in diameter. They are attached only to the skin and can be seen as early as 60 days after birth. Scurs are not an error in transmitting the horned characteristic and should be ignored.

### RECESSIVE HAPLOTYPES

The following codes show on a sire summary evaluation if an animal is a carrier or tested positive for a specific Haplotype. If the animal tested free, the codes will be indicated on the animal's pedigree.

TC: Tested free of Cholesterol Deficiency

HCD: Cholesterol Deficiency

TY: Tested free of Brachyspina

BY: Brachyspina

TV: Tested free of CVM

CV: CVM or Complex Vertebral Malformation

TL: Tested free of BLADS

BL: BLADS or Bovine Leukocyte Adhesion Deficiency

TD: Tested free of DUMPS

DP: DUMPS or Deficiency of the Uridine Monophosphate Synthase

### HHH & RECESSIVES

USDA researchers and international collaborators identified nine haplotypes that cause embryo loss or stillbirths when homozygous. The exact genetic or biological cause of why the embryos or fetuses are not viable is unknown. These are six common Haplotypes, their frequency and source sires of the Haplotype:

Holstein Haplotype 1 (HH1) - 4.5% freq., Pawnee Farm Arlinda Chief

Holstein Haplotype 2 (HH2) - 4.5% freq., Willowholme Mark Anthony

Holstein Haplotype 3 (HH3) - 4.7% freq., Gray View Skyliner & Glendell Arlinda Chief

Holstein Haplotype 4 (HH4) - 0.7% freq., Besne Buck

Holstein Haplotype 5 (HH5) - 4.8% freq., Thronlea Texal Supreme

Holstein Haplotype 6 (HH6) - 0.5% freq., Cal-Clark Board Chairman

Recessive haplotypes appear to be normal. Those with two haplotype copies are lost as embryos or are stillborn. Their negative impact is accounted for in sire conception rate (SCR) and daughter pregnancy rate (DPR). Only when both parents are heterozygous Haplotype carriers may offspring be affected.

### VARIANT RED

**566HO1345 EVER-RED** is a Variant Red sire and labeled as DR1. Anytime a Variant Red sire is bred to a Black, Red Carrier or Red animal, there is a 50% chance for a Red calf and 50% for a Black calf. When a Red animal is the result of using a Variant Red sire, the Red gene is transmitted to the second generation differently than with traditional Red hair color. When a true Red sire is used on a Variant Red daughter, there is a 50% chance of offspring being Red and 50% offspring will be Black.