

Table S1. Definition of genotypic/phenotypic parameters for production traits in high-producing primiparous cows (Supplementary Materials)

| Traits and Indexes | Nomenclature | Units | Description | Parameter Type |
|--|--------------|----------------------|---|----------------|
| Milk production at 305d | MP305G | lbs | Evaluates genetic differences in total pounds of milk produced during a 305-day lactation. | Genotype |
| Fat percentage at 305d | PF305G | % | Evaluates genetic differences in the percentage of milk fat produced during a 305-day lactation. | Genotype |
| Somatic Cell Count | SCCG | Score | Indirectly assesses susceptibility to mastitis. A low value indicates a more favourable value of somatic cells throughout lactation compared to the breed base. | Genotype |
| Milk Protein production at 305d | MPPROT305G | lbs | Evaluates genetic differences in pounds of milk-protein produced during a 305-day lactation. | Genotype |
| Protein percentage at 305d | PP305G | % | Evaluates genetic differences in percentage of milk-protein produced during a 305-day lactation. | Genotype |
| Milk fat production at 305d | MPFAT305G | lbs | Evaluates genetic differences in pounds of milk-fat produced during a 305-day lactation. | Genotype |
| Mastitis Resistance | MRG | % | Evaluates an animal's genetic resistance to mastitis. High values are consistent with animals with greater resistance to mastitis. | Genotype |
| Total Litres of Milk | TLM | L | Evaluates the total litres of milk produced during a 305-day lactation. | Phenotype |
| Total Fat | TFAT | lbs | Evaluates the amount of fat produced during a 305-day lactation. | Phenotype |
| Total Protein | TPROT | lbs | Evaluates the amount of protein produced during a 305-day lactation. | Phenotype |
| Milk projection at 305 d | MPJ305 | L | Evaluates the amount of milk projected for a 305-day lactation. | Phenotype |
| Average Litres of milk | ALM | L | Evaluates the average milk in litres produced per day. | Phenotype |
| Fat Percentage | FATP | % | Evaluates the percentage of fat per litre of milk produced. | Phenotype |
| Protein Percentage | PROTP | % | Evaluates the percentage of protein per litre of milk produced. | Phenotype |
| Litres of Current Corrected Milk | LCCM | L | Evaluates the current amount of milk produced corrected to 305 days of lactation. | Phenotype |
| Milk Projection 305 days Maturity Equivalent | MPJ305ME | L | Estimates the projected milk production at 305 days which is equivalent to accumulated production maturity in each month. | Phenotype |
| Somatic Cell Count | SCC | x10 ³ /mL | Assesses the value of somatic cell concentration throughout lactation. | Phenotype |
| Logarithm of Somatic Cell Count | LGSCC | Log2-Score | Assesses the value of the adjusted somatic cell number in a lactation. | Phenotype |
| Urea | U | mg/dL | Evaluates a value that reflects the ureic nitrogen to a correct energy/protein balance. | Phenotype |