

GenTORE Glossary

General Statement: This glossary is prepared to define some of the terminology used in the GenTORE project. In general, the definition of these terms might have a broader meaning, but we tried to specifically focus on the meaning that is used in GenTORE publications. This glossary will be updated on a regular basis.

ALGORITHM: An algorithm is a step by step procedure to solve a problem or perform a task. Generally, we mainly refer to algorithms in the context of computer science, where algorithms are used to save time and resources for generating high-quality solutions.

DECISION SUPPORT TOOL: Various methods incorporated into an algorithm, usually in the form of a computer or app, that transforms multiple sources of information (such as milk yield, genomic information and health status) into interpretive management aids for the farmer.

EFFICIENCY: Refers to the ratio between the produced outputs and the related inputs; maximizing outputs from a given amount of input is considered efficient. In GenTORE we refer to feed efficiency, described as the ratio of energy in the final animal product (output) to the energy ingested by said animal (input), measured over a certain time period.

GENETIC MERIT: Inherited productivity or performance qualities. Genetic merit can be defined as how an animal ranks, relative to other selection candidates, for its ability to produce superior offspring.

GENETICS: Genetics is a branch of biology concerned with the study of genes, genetic variation, and heredity in organisms.

GENOMICS: Genomics is a discipline in genetics concerned with the study of the genome of an organism. Genomics focuses on interactions between loci and alleles within the genomes and interactions such as heterosis, epistasis and pleiotropy... The field includes efforts to determine the entire DNA sequence of organisms and fine-scale genetic mapping.

GENOMIC BREEDING INDEX: A ranking animals based on their genomic breeding values. It incorporates genomic information on traits that are part of the selection criteria used in a specific breeding program.

GENOMIC PREDICTION: The prediction of phenotypes or (genomic) breeding values based on an animal's genetic merit, by scoring of DNA markers such as SNPs.

HETEROSIS (HYBRID VIGOR): The degree to which the performance of a crossbred animal is better or worse than the average performance of the parents.

HERITABILITY: Heritability is a measure of an animal's ability to transmit its genes on to the next generation. These could be genes for production, for conformation, for a combination of the two, or for any other heritable trait that can be measured.

MANAGEMENT INDEXES: A management index can be explained as a decision support tool that incorporates multiple factors to predict future performance of an animal in order to propose management practices (for instance should the animal be culled yes or no). A genome-based management index incorporates genome-based information sources.





PHENOTYPE: All the observable physical characteristics of an organism including color, shape, size, biochemical properties, performance and behavior, which result from the expression of its genotype in a given environment.

PRECISION LIVESTOCK FARMING (PLF): PLF is the use of computer technologies to monitor animals, often at individual level, allowing the farmer to have real-time information on the performance, health and well-being of the farmer's animals. This then allows the farmer to tailor management to individual animal needs with the aim to deliver improved efficiency and sustainability in livestock farming.

PROXY: A measured variable used to infer the value of a variable of interest that is usually difficult to measure directly, such as resilience. In GenTORE we aim to develop a proxy for resilience as resilience in itself is not (yet) quantifiable and we wish to define an operational measure for resilience (which we could use for breeding or management practices).

RESEARCH INSTITUTE (KI): An organization where scientific research is done in different fields.

RESILIENCE: In livestock production it refers to the capacity of the animal to deal with environmental perturbations. It can be measured via the extent of animal responses to, and rates of recovery from, the perturbation. We consider an animal resilient when it is minimally affected by a disturbance (for instance exposure to a virus) and will quickly return to its original state as pertained before exposure (e.g. same milk production levels). Resilience generally engages multiple underlying components (physiological and behavioral mechanisms). Farm system resilience can also be considered in the same terms, in which the resilience capacity of the animals is one component.

RFI (RESIDUAL FEED INTAKE): The difference between observed feed intake and that predicted on the basis of requirements for production, maintenance, and other life functions. It is used to identify individual animals that are more (i.e. have a negative RFI) or less (i.e. have a positive RFI) efficient than the mean of the group being measured.

ROBUSTNESS: Robustness of a biological system is the persistence of a certain characteristic or trait in an environment that imposes constraining conditions. In animal production, robustness has been defined as the ability to maintain a high production combined with maintaining other life functions in a wide variety of environmental conditions.

SOMATIC CELL COUNT (SCC): Somatic cell count is the total number of cells per milliliter in milk. Somatic cells in milk are composed primarily of leukocytes (white blood cells) and of a small part of epithelial cells normally flaking from mammary glands. In case of mammary gland inflammation, the number of leukocytes significantly increases, and therefore SCC is an important indicator of udder health in cows. Commonly, an individual cow SCC higher than 200,000 cells/mL is considered as indicator of subclinical mastitis, whereas SCC over 300,000 cells/mL is considered as indicator of mastitis with suspect of pathogen infection. In the European Union, bulk tank milk with an SCC higher than 400,000 cells/mL cannot be intended for human consumption.

SUSTAINABILITY: Can be summarized as development that meets the needs of the current population without compromising the ability of future generations to satisfy their needs. Sustainability looks to protect our environment and health while driving innovation and





technological advancements in a responsible and appropriate way, being environmentally friendly, economically viable and socially acceptable.



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