Statistical Indicators
E-28
Publication rules cow indexes

▪ Introduction

Breeding values of cows are estimated on the basis of information about parents, observations on the animal itself, offspring and foreign information. CRV is a herd book and as such responsible for the breeding values. The introduction of genomics has made it possible to predict the genetic value of an animal in the population. Breeding values based on this genomic information are called genomic breeding values and are based on parental information and DNA testing.
The herd book CR Delta is responsible for the estimating and publishing of breeding values. CRV estimates these breeding values under direct responsibility of CR Delta, who is a herd book recognised by the government.

Breeding values based on the usual information sources (pedigree, performance and offspring) are referred to as conventional breeding value.

Genomic breeding values and conventional breeding values are estimated in two separate genetic evaluation systems. Breeding values from both systems are combined in a post-processing step after these two genetic evaluations, generating a combined breeding value.

There are different types of breeding values: the national breeding value, the parent average and the converted breeding value. If a combination of information sources is used, we speak of a national breeding value. If a breeding value is only based on the information source 'parents', the breeding value is called an expected breeding value. If the breeding value is only based on foreign information, we speak of a converted breeding value. The publication requirements for all three types are the same.

This chapter describes the requirements for obtaining an official breeding value. The term official breeding value means that this breeding value is entered in the database of the recognized herd book organizations and that these breeding values will be used on products of these organizations.

▪ Publication rules

The publication of (official) breeding values depends on a number of aspects:
- Herd book registration;
- Reliability of the breeding value;
- AI tested proof sire;
- NVI-index;
- Conformation breeding values ;
- Udder health;
- Persistency, late maturity and individual lactation breeding values.

Herd book registration
Breeding values of a cow are published if the cow has a herd book registration from one of the organizations that supply pedigrees of the animals for the breeding value estimation.

Reliability
When calculating the breeding value, reliability is also calculated. This number, between 1 and 99, represents the amount of information on which the breeding value is based. It also represents the possible extent for a change of the breeding value if new information is added to the breeding value.

Reliability has to be at least 10 percent of the main trait of a trait group. When the main trait meets this requirement, the other breeding values of that trait group are also published. Table 1 shows an overview of the main traits per trait group.
For the Automatic milking traits, the publication rules are applied to each trait separately. The traits are; efficiency, milking interval and habituation of heifers.

Table 1 Overview of the main traits per trait group.

Trait group	**Main trait**
Milk Production	Overall INET
Conformation	Final Score
Durability	Durability
Fertility	Overall Fertility
Somatic Cell Count	Overall Somatic Cell Count
Udder Health	Udder Health
Claw Health	Claw Health
NVI	NVI
Calving ease (paternal)	Calving ease
Maternal calving process (MCP)	Maternal calving process
Vitality (Paternal)	Vitality
Maternal vitality	Maternal vitality
Beef index characteristics	Beef index
Milking Speed	Milking Speed
Character	Character
Persistency	Overall Persistency
Late maturity	Late maturity
Urea	Overall Urea
Automatic Milking Traits	Every trait
Ketosis	Overall ketosis
Dry Matter Intake	Overall Dry Matter Intake

AI tested proof sire
An AI tested proof sire is a sire that:
- has an AI code in the Netherlands and/or a semen number in Flanders;
- its owner is not a farmer, but, for example, an AI organization or an importer.

If the sire of a cow is an AI tested proof sire whose production/ conformation breeding value has not yet been published, then the production/ conformation breeding value of the daughter of this sire will also not be published. However, the rule for conformation is that if the sire of a cow has been born six years before the publication date, the conformation breeding value of that cow will be published if it complies with the reliability requirements.
For production however, the rule is that if the cow has been producing for at least 220 days, the production breeding values will be published if they comply with the reliability requirements.

NVI
In calculating the NVI, all published breeding values of a cow are used. Therefore, if a breeding value is not published, it will also not be used in the calculation of the NVI. The breeding value type of the NVI is copied from the type for the breeding values of the milk production. A cow obtains an NVI index if its breeding value for overall milk production has been published.

Conformation breeding values
Conformation breeding values of a cow are published if the classification of the cow has been executed by CRV, VRV or FHRS.

Persistency, rate of maturity and individual lactation breeding values
Persistency, rate of maturity and individual lactation breeding values are published if the cow has a published milk production breeding value.

Birth-index
The birth index will be published if the breeding value of one of the four traits is published.

▪ The use of foreign breeding values for production and conformation

At present, production and conformation breeding values are converted for cows. Foreign breeding values are retrieved for foreign animals that are known in the breeding value estimation. For milk production the breeding values of Holstein cows are retrieved from the USA, Canada, Denmark, Germany, France and Italy. Foreign conformation breeding values of Holstein cows are retrieved from the USA, Germany, France and Italy.

Production breeding value
For animals with a Dutch and a converted production breeding value, the following applies:
The conversion of the foreign breeding value is done with the conversion factors that are supplied by Interbull. The following publication rules apply:

- If the cow itself has day productions that are being used in the test day model (NL-TDM), then its foreign information is not used and its published breeding value is based on its national day productions, its parent information and any possible offspring in the NL-TDM. Of course the parent information of the cow may contain foreign information.
- If the cow itself has no day productions that are being used and it does have offspring in the NL-TDM, then the converted foreign breeding value is integrated in the national breeding value of the female offspring. The converted and the national breeding value are used in the cow index on the basis of the reliability of the converted and national breeding value and the genetic correlation between both breeding values.
- If the cow itself has no day productions that are being used and it doesn't have any offspring in the test day model (NL-TDM), then the converted breeding value of this cow is published.

Conformation breeding value
For animals with a Dutch and a converted conformation breeding value, the following applies:
The conversion of the foreign breeding value is done with the conversion factors that are supplied by Interbull. The converted breeding value is official if the reliability of the converted breeding value is at least 5% higher than the reliability of the Dutch breeding value. If not, the Dutch breeding value is the official one.