Index figures

E-9
Dutch production index (INET)

▪ Introduction

In the world of cattle breeding, selection based on milk production traits plays an important role. The tools used to assist the selection procedure are the cow and bull indexes for milk, fat and protein. The breeding values for the kg of milk, kg of fat and kg of protein are combined to create a single figure: the Dutch production index or Inet. The way in which these breeding values are combined to create the Inet rating is such that selection based on Inet leads to increased profitability in milk production per cow.

The Inet figure is calculated according to the following formula:

Inet 2012 = -0.03 * BV kg milk + 2.2 * BV kg fat + 5.0 * BV kg protein

BV stands for breeding value in the formula. The figures –0.03. 2.2 and 5.0 are called the Inet factors. For example: Imagine a bull has the breeding values +1000, +35 and +30 for kg milk, kg fat and kg protein respectively. The Inet of this bull is equal to –0.03* 1000 + 2.2* 34 + 5.0* 30 = 195 euro (to a round figure). The same formula is applied to cows.

▪ Significance of INET

In breeding the central focus is to produce more highly productive and profitable cows through selection. The Inet rating indicates what can be expected from the progeny in extra net yields per lactation if a certain cow is mated with a certain bull. To give an example, we will mate a bull with an Inet of 400 euro with a cow that has an Inet of 200 euro. A calf resulting from this match is expected to have an Inet of 300 euro, which is 100 euro more than its dam. In other words: the calf is expected to yield a net milk production income per lactation of approximately 100 euro more than its dam.
The Inet factors indicate the net yield per kg milk. kg fat and kg protein provided through breeding the production per lactation for milk, fat or protein is increased by one kg . A higher production of one kg of milk per lactation through breeding, without a similar rise in the production of fat and protein, will cost 3 cents. Selective breeding that results in an increased production of one of fat will yield € 2.20, with € 5.00 for one kg of protein.

▪ Calculation model

The economic weighting factors are determined by calculating the difference in farm income if there is a marginal increase in production per cow whereby all the other conditions remain unchanged. The situation (milk price) likely to apply in eight to ten years is taken as the basic assumption in this calculation. The marginal increase in production per cow is the result of the marginal increase of the genetic capacity of the cow for higher production. So, what does an increase in the breeding value of a cow of one kg milk, fat or protein represent at a dairy farm?

When determining the new Inet it is important to consider what is likely to change in the coming years. A significant change for farmers is the disappearance of the milk quota. The abolition of the milk quota means that dairy farmers are no longer tied to these production rights as a quota holder. Farmers can supply more milk and fat without being liable to pay levies for over-production of milk. Farmers can boost their production by increasing the size of their herd and/or increasing the individual production of each cow. If a farmer decides to opt for more cows in the herd he is restricted by the capacity of his barn and also the amount of land - in connection to feed and manure production, which in turn is linked to manure disposal. If factors such as efficiency of milk production in relation to, for example, feed consumption, manure production and methane emissions are considered, then the more attractive option for a farmer is to continue to increase production per cow. By increasing production per cow the costs entailed in breeding, as well as the costs for husbandry, are divided per individual animal over a higher number of kilos of milk. This is also an important principle when compiling the Inet: using Inet based selection will lead to milk production taking place more efficiently

Costs for energy and IDP
The calculation model calculates the energy and protein required for milk, fat and protein. To only produce milk or fat, energy is required, producing protein require energy and protein. The feed costs kg milk, fat or protein are calculated as (energy requirement)*price of energy)+(protein requirement/IDP)*(price of/IDV). Per kg milk, fat and protein is resp. 0.11. 5.9 and 3.0 kFUM required in energy and for 1 kg of protein 1.56 kIDV is required.
To calculate the feed costs, a price for medium-priced A-pellets of 18 euro/100 kg is assumed and a price ratio of 6 between kIDV and kFUM : 1. This results in a price of 1 kFUM of € 0.107 and a price of 1 kIDV of € 0.639.

Milk price in the future
The results of decisions about breeding taken now will only show in eight to ten years time, so when considering the significance of the Inet we have to estimate what milk will be worth eight to ten years ahead.

The average advance for 1 kg fat granted by FrieslandCampina in the period 2009/2010 was € 3.11, and € 5.43 for protein. The advance price is on average 95% of the final payment price, whereby the average price for fat and protein totals respectively at € 3.27 and € 5.72. This corresponds to a milk price of 32 euro cent/litre with 4.2% fat and 3.4% protein.

In Flanders the payment method used by Milcobel differs to the system in the Netherlands. There is no negative land price and a fixed price ratio between fat and protein of 0.35:0.65 applies. This method of payment is not expected to change in the foreseeable future. The average price for 1 kg fat granted in the period 2009 -2010 was € 2.46, and € 4.56 for 1 protein. If in Flanders an identical milk price is expected per kg of milk, whereby the fat and protein contents are 4.30% and 3.50%, respectively, then the price for 1 kg of fat would be € 2.96 and € 5.50 for 1 kg of protein. The average price for 1 kg fat in the period 2010 was € 2.79, and € 5.18 for 1kg of protein.

The trends to be expected:
- the world's population will continue to grow, entailing a corresponding increase in the need for food;
- the economy will continue to grow in emerging countries - which also have booming populations;
- the average wealth of consumers will rise and thereby also the demands placed on food. The demand for dairy products rises in line with increasing prosperity;
- consumption of dairy produce will rise, partly due to a shift in eating patterns from vegetable-based protein to animal based protein. The long-term expectation is that the rise will be around 30% in developing countries and around 10% in developed countries;
- dairy production will rise approx. 2% per year until 2019;

- in the future the milk price will be subject to more fluctuation due to the many factors that influence the supply and demand;
- according to the IFCN the payment prices for fat and protein are expected to show less mutual discrepancy in the coming years. Subsequently the attention will probably shift to protein, resulting in a higher price for protein compared to fat;
- the higher fat price is partly caused by a different pattern of consumption in developing countries;
- greater attention for the environment, whereby reduction in the greenhouse gas emissions will become very important. One way of achieving this reduction in emissions per kg of milk is to produce milk more efficiently. This can be achieved by increasing the production per cow, for example.

In order to identify the expected models in the future consultation also took place with FrieslandCampina, Partico and Milcobel. The dairy industry indicates that it is, and remains, awkward to predict price forming for the future. However, certain trends are expected to appear. At the moment lactose is used a lot in many types of milk-based products, including baby food. Lactose has added value for these products. In the future, this value could be part of the payment system, whereby a certain amount is paid per kg of lactose, for instance.
When the milk quota is abolished the dairy industry expects more milk to be produced, which will also mean that finding a market for the additional milk fat supplied by dairy farmers will become more difficult.
The dairy industry expects that milk protein will have a clear added value, but that in the future fat will be valued lower resulting in a lower payment price to farmers. What also plays a role here is that milk fat can more easily be replaced in other products by vegetable-based fat.

In view of the information above, the following points have been assumed in the calculation of the Inet factors:
- the milk price is 32 eurocent per kg milk, with 4.2% fat and 3.4 % protein
- the negative land price for 1 kg milk is € -0.015 per kg milk
- the ratio for protein/fat price is 2.25 : 1
- this results in a price for 1 kg fat of € 2.85, and € 6.35 for 1 kg protein.

▪ Results

Based on the energy consumption and the protein demand from feed to produce milk, fat and protein, the feed costs are 0.012. 0.63 and 1.32 euro per kg milk (carrier), kg fat and kg protein. The yield per kg of milk (carrier), kg fat and kg protein is -0.015. 2.85 and 6.35 euro respectively.

If the costs are subtracted from the yields the net yield is left, taking the feed costs into account:

Inet = -0.027 * BV kg milk + 2.22 * BV kg fat + 5.03 * BV kg protein

Following the weighting factors being rounded up, the Inet per April 2012 will be as follows:

Inet 2012 = -0.03 * BV kg milk + 2.2 * BV kg fat + 5.0 * BV kg protein