

The Israeli Selection Index

Ephraim Ezra / Joel I. Weller

The Israeli breeding program is monitored by the Israeli Breeding and Herdbook Committee, which includes representatives of the Sion A.I. Company, the Israeli Cattle Breeders Association, and scientists of the Department of Ruminant Science of the Institute of Animal Sciences of the Agricultural Research Organization.

PD11 – THE ISRAELI BREEDING INDEX

Index coefficients for milk, fat, and protein were computed to maximize expected farmer profit. Profit was computed as income, less cost of feed required to produce the three milk components, transportation costs for fluid milk, and the fixed costs per cow, which were set so that the net profit would equal zero. The index coefficients were computed by differentiating the profit equation with respect to each component. The index coefficients were normalized so that one standard kg of milk with 3.574% fat and 3.186% protein, would have a unit value. The index coefficient for somatic cell score (SCS) was computed so that expected changes for SCS would be close to zero. The index coefficients for daughters' fertility, herdlife, persistency, dystocia, and calf mortality were computed to account for the economic value of those traits relative to milk production. The current Index PD11 was updated in January 2011, to adjust for the increase in the price for milk fat in the world market. PD11 is as follows:

$$\text{PD11} = 7.9 (\text{kg fat}) + 23.7 (\text{kg protein}) - 300 (\text{SCS}) + 26 (\% \text{ daughters' fertility}) + 0.6 (\text{days herdlife}) + 10\% (\% \text{ persistency}) - 3 (\% \text{ dystocia}) - 6 (\% \text{ calf mortality})$$

Expected genetic gains after ten years of selection using this index are: 509 kg milk, 20.0 kg fat, 17.7 kg protein, - 0.11 SCS, 1.2% daughters' fertility, 107 days herdlife, 1.7% persistency, -0.83% dystocia, and -0.67% calf mortality.

Genetic evaluations for milk, fat and protein production, SCS, daughters' fertility and persistency are calculated by the multitrait animal model, using parities 1 to 5, with each parity considered as a separate trait. Herdlife is calculated by a single trait animal model. "Persistency" is persistency of milk production. Dystocia and calf mortality refer to the effect of the cow calving, and include only first parity records. Dystocia and calf mortality are calculated by sire and maternal grandsire models. The base for all genetic evaluations is the mean breeding value for cows born in 2005.