News in Dairy Genetic Evaluation August 2020

- **New, additional Total Merit Index RZ€**
- **New relative weights in RZhealth**

New Total Merit Index RZ€

With the August 2020 an additional Total Merit Index is published evaluation for Holstein and Red Holstein, the RZ€ (pronounce RZ Euro). Different to the RZG and most single traits and indices the RZ€ is not expressed on the relative base, but on the scale 'margin in €'. The margin refers to the entire lifetime of a cow i.e. about 3 years or 3 lactations.

The calculation of RZ€ is based on the economics of EBV differences between animals in all traits. The economic importance can't be calculated on the base of relative EBV, but only on the phenotypic scale. The transformation of relative EBV to the phenotypic scale is based on the performance differences of daughter proven bulls with high resp. low EBV for the respective trait (see column 'Average and Sg' in table).

Margin per trait unit

Base scenario for calculation of the margin is an average cow managed under average conditions. Based on this scenario the margin for one extra/less unit on the phenotypic scale is calculated (e.g. +1 kg protein, -1 case of mastitis). The margin therefore refers to the differences caused by genetics between two animals within farm, independently from the level of overall margin of the farm.

The assumed costs and returns refer to data from practice (e.g. data used by chamber of agriculture in consultations) and scientific publications. Level of average costs and returns are changing over time. The resulting margin and specifically the ratio of margin between traits is changing much less. Nevertheless, margins should be verified from time to time.

Within the calculation of margins only directly associated effects are considered, but not indirect effects via other traits with own direct margins. Within the daughter fertility traits for conception only first-to-last-insemination (heifers and cows) is considered, but not non-return-rate to avoid double counting.

A margin for cell count (RZS) is not included in RZ€ because a reduction of cellcount with a given unchanged mastitis incidence rate is not included in RZ€. For the majority of farms a lower cell count level at a constant mastitis incidence rate has no extra margin. The same holds for conformation traits, that have very limited direct economic impact through sales of cattle/heifers, and therefore are not included in RZ€, too. Economic impact of improvement for conformation is mostly indirect i.e. via improvement of health, fertility and herd life. These effects are included already in the margins for these traits.

Calculation of RZ€ follows index theory, i.e. correlations between traits and animal individual reliabilities of trait EBV are considered.

Comparison of margins for the different traits

The following table shows the margins per single trait resp. per health index and the resulting relative weight in RZ€.

EBV trait		€ per unit resp. per case	Average (and Sg)	€/Sg per lifetime	resultierende relative Gewichtung (%)		
Fat (kg)		2.56	360.7 (± 25.1)	**197.72**	20.7		
Protein (kg)		4.09	305.8 (± 19.7)	**248.76**	26,0	41	Production traits
Lactose in F/P free milk (kg)*		-0.024	9058 (± 690)	**-51.13**	-5.3		
RZN/Herdlife (day)		1.00	1115 (± 259)	**258.69**	27.0	27	Herdlife
Calving-to-first (day)		0.34	84.2 (± 9)	**6.05**	1.1		
First-to-last-insemination heifers (day)		1.64	31.3 (± 6.2)	**10.35**	0.6	7	Daughter fertility
First-to-last-insemination cows (day)		3.67	51.5 (± 10.1)	**52.06**	5.4		
Stillbirth rate maternal		137.5	4.1 (± 3.1)	**12.81**	1.3		
Stillbirth rate direct		137.5	2.4 (± 2.4)	**9.87**	1.0	3	Calving traits
Calving ease maternal		59.38	3.2 (± 1.7)	**4.03**	0.4		
Calving ease direct		59.38	3.5 (± 2.0)	**5.03**	0.5		
RZcalffit (young stock survival)		449.7	93.0 (± 4.4)	**54.61**	5.7	6	Young stock surv.
RZudderfit	Mastitis	186.02	25.5 (± 12.0)	**61.39**	6.4	16	Health traits
RZhoof (hoof health)	mortellaro	32.00	n.a. **	**30.13**	3.1		
	sole ulcer	68.90					
	digital phlegmon	62.00					
	white line defect	32.00					
	laminitis	32.00					
	tylom	73.52					
RZrepro (Repro. disorders)	ovarian cycle disorders	28.00	n.a. **	**17.10**	1.8		
	metritis	97.71					
	retained placenta	99.59					
Rzmetabol (metabolic stability)	displaced abomasum	289.28	n.a. **	**39.86**	4.2		
	milk fever	139.71					
	ketosis	131.38					

*) feed costs for non-paid lactose in delivered milk

**) not available, because of several traits within the index and therefore no value per trait possible

The Euro scale

Basis for RZ€ is – like for all EBV and indices – the current cow population, i.e. 4-6 years old cows. These base cows have in average a RZ€ of +-0 Euro. Spreading of RZ€ is approximately 530 €.

RZ€ is calculated and published only for Holstein and Red Holsteins, because for the other breeds no health EBV are available so far. Therefore RZ€ for other breeds wouldn't be complete and comparable with Holstein.

For more details on background and calculation of RZ€ check the vit homepage www.vit.de => news 'The new total merit index RZ€ - focus on economy of dairy production' (2020 July 9th).

New relative weights in RZhealth

Within the development of the new RZ€ for the first-time detailed calculations on the economic importance of health traits were made. The results led to new relative weights within the index for total health, the RZhealth:

- RZudderfit 40 %
- RZhoof 20 % (before 30%)
- RZrepro 15 % (before 20%)
- RZmetabol 25 % (before 10%)

The relative weight for metabolic stability in RZhealth was increased significantly.

***vit**, Verden*
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