IMPROVING A SIMPLE INDEX FOR ESTIMATED BREEDING VALUE, WHICH REFLECTS THE REAL BREEDING VALUE OF PEDIGREE BULLS IN DIFFERENT GENOTYPES

Einfache Methode zur Bildung von den effektiven Zuchtwert richtig zurückgebenden Zuchtwertzahlen bei Zuchtbullen von unterschiedlichen Genotypen und Nutzungsrichtungen

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Possibilities of assessing the meat production abilities of different cattle breeds and genotypes in more depth was started after 1970 in Hungary. Naturally, there have been preliminary experiments conducted with Hereford, Charolais, Angus and some dairy breeds respectively, but the base of beef production for a couple of decades was the Hungarian Fleckvieh.

Progeny tests of hereditary traits for beef production of pedigree bulls started in 1974. We have been assessing the most typical meat production traits within the evaluation system and classifiing of bulls were as per scoring. Among these traits, most significant was the average daily gain (ADG), daily carcass yield, live animal scoring values and killing out percentage. We have evaluated the 18,061 offsprings of 956 pedigree bulls, classified into twenty (20) different genotypes between 1975 and 1980. (See table 1.)

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In the course of evaluation, we concluded, that the Hungarian system of pedigree bull classification (which incorporates cca. a 50% ADG, 25% daily carcass yield, live animal scoring values and a 12,5 - 12,5 killing out percentage in offspring performance) does not reflect exactly the real breeding value of pedigree bulls and has a negative impact in selecting the best bulls for breeding programs. Thus, we have worked out, a simple method, which with the help of progeny test is adequate for the assessment of breeding value in cases, when the absolute value of the previously mentioned four (4) meat production traits are available.

At first, code of 18,061 offsprings of 956 pedigree bulls were done as traits:

	score
Absolute max.:	9,oo
Average:	5,oo
Min. and below value:	1,oo

In the second phase, each of the traits of the pedigree bulls were determine i.e.:

- if the pedigree bull was classified for intensive feeding program, then ADG will be the dominant factor
- if, pedigree bull was classified for large and good quality beef production for instance, then killing out percentage will be the dominant factor, etc.

In case pedigree bull classification was combined with the right correction factor relevant to each type, then breeding values may be of great help in the pre-selection of terminal sires. However, we would like to point out, in selecting terminal sires, that examination of reproductive traits (sperm production, fertility, ability and effect for easy calving etc.) should not be ommitted.

For the evaluation of progeny test values and coded values of pedigree bulls, we applied a four (4) variation regressive analysis. This method helped us to determine the correlation between the absolute scoring value and the previously determined beef production traits value. Comparative relationship assessment revealed the

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deficiency of the bull classification system currently being in use with the consent of the goverment. In spite of the fact that the National Feeding and Animal Breeding Inspectorate (N.F.A.B.I.) applies the equation

$$Yo = 4x_1 + 2x_2 + x_3 + x_4$$

which in the scoring value of "x" are next:

x_1 = average daily gain
x_2 = daily carcass yield
x_3 = live animal scoring
x_4 = killing out percentage

and considers the scoring values of each of the animals in the above mentioned ratio, in the course of classification, only the absolute and relative performance of the pedigree bull nominee is evaluated with in the classification cycle.

However, complex values drawn up by us, approach the animals' (and genotypes') real breeding value as per the standards of progeny test-results of observed age-group in identical circumstances. Breeding values of classification, which become dominant for the different selective purposes were calculated as:

$$Y = \frac{ax_1 + bx_2 + cx_3 + dx_4}{72} \cdot 100$$

In the calculation of EBU-indexes, the weighting ratio was different value.

The ratio in Y_1 index: 4 - 2 - 1 - 1.

In Y_2 the classification value of four (4) production traits determined with equal weighting, and Y_3 complex value indicating the killing out percentage as preference-selective factor. The Y_4 complex value of daily carcass yield expressed as preference-selective factor, and the Y_5 complex value indicating the conformation value as the most simple evaluating traits and emphasized ADG.

Concerning the 956 evaluated bulls overall and as per breeds (stressing the nine (9) most important genotypes, all those five (5) scoring values, which accordingly make the different traits important, reflect the relationship of real progeny performance and

Table 2. The complex values and their relation with pedigree bulls progeny in nine different genotypes (beef production traits)

	Y_o	r_o	Y_1	r_1	Y_2	r_2	Y_3	r_3	Y_4	r_4	Y_5	r_5
Hung.Fleckvieh	59,73	o,5o	58,55	o,99	58,33	o,99	58,o8	o,99	58,16	o,99	59,18	o,99
Aust.Fleckvieh	59,92	o,51	59,o4	o,98	59,29	o,99	58,76	o,99	58,7o	o,99	59,96	o,94
Simmental	66,81	o,61	57,51	o,96	58,15	o,69	57,27	o,5o	57,86	o,95	58,o4	o,97
Limousin	62,5o	o,55	53,43	o,98	58,o6	o,99	59,63	o,99	54,88	o,98	5o,38	o,95
Hereford (UK)	55,98	o,87	25,o5	o,99	32,76	o,98	36,81	o,99	25,58	o,99	2o,44	o,99
Hereford (US)	55,13	o,75	2o,88	o,91	28,27	o,97	3o,o6	o,98	21,19	o,95	18,81	o,83
Eur.Red.Fries.	58,34	o,57	53,77	o,99	53,43	o,97	53,84	o,93	54,o8	o,99	53,11	o,97.
Holstein Fr.	58,o7	o,72	5o,72	o,99	44,29	o,99	47,o5	o,99	49,2o	o,99	49,47	o,99
Red Holstein	58,49	o,71	49,9o	o,99	43,79	o,99	44,77	o,99	47,9o	o,99	5o,93	o,99

Table 1. Beef Progeny Test Results or Different Breeds and Crosses in Hungary /1975-80/

Sire breeds	No. bulls	No. offspring	Age at slaughter /day/	Weight at slaught. /kg/	Average daily g. /gr/	Average carcass /gr/	Live scoring /point/	Killing out % /%/	400 day weight /kg/
Hmg.Flekvieh	566	1o 658	451	544	1211	7o5	86,7o	6o,88	483
Aust.Flekvieh	134	2 438	451	545	1212	7o6	87,3o	61,oo	483
Simmental	15	268	458	544	1192	7o6	87,29	6o,68	474
Limousin	24	676	466	533	1145	686	86,5o	62,87	457
Hereford /UK/	8	1o6	525	459	881	528	79,31	61,77	35o
Hereford /US/	13	152	539	441	824	463	8o,48	59,94	328
Ear.Red Fries.	27	383	457	541	1189	694	84,3o	6o,48	474
Holstein Fr.	48	1 153	436	527	121o	683	76,96	59,17	484
Red Holstein	38	72o	446	542	1217	672	78,36	58,26	485
Ear.Red Fr.Fl.	5	79	463	578	1249	765	89,3o	59,o7	499
Red Holstein Fl.	48	678	438	531	1211	7o2	83,63	6o,21	485
Red Holstein Rl.	7	1o1	455	566	1246	714	85,o1	61,68	497
Red Holstein R2.	4	69	432	536	1239	699	82,97	58,o2	496
Red Holst.X	3	44	428	489	1144	686	86,5o	62,87	457
Kostromskaya	2	113	5o9	554	1o87	-	-	-	435
Blonde d'Aquit.	1	14	441	57o	1292	766	8o,6o	63,7o	517
Impr.Flekvieh	2	38	436	551	1262	821	9o,45	61,5o	5o5
Bavarian Flekv.	3	37	439	518	1181	651	86,8o	62,63	472
Czech Flekvieh	1	15	453	558	123o	621	91,5o	61,7o	493
Milking Flekv.	7	319	493	554	1127	651	87,91	61,o7	45o

the breeding values calculated by us. (See table 2.), versus the official scoring value, which does not provide a realistic comparison and does not reflect real progeny performances.

Due to the fact, that in the course of pedigree bull classification (scoring), the terminal dam and the terminal sires selection has to be performed, we find comparison of each of the genotypes necessary to one another.

Because the N.F.A.B.I. classification (a cyclic comparison)is only performed within a genotype the scale of values is not reflected in the progeny performance observed.

With the application of breeding values scale of values for individual genotypes evaluated as per meat production traits emerges to the surface. We reckon,that beef progeny bull classification as per breeding value-figures can be accomplished with good results in situations, where they are able to measure the performance in ADG, daily carcass yield, killing out percentage and can take care of live animal scoring. This method is appropriate for evaluating the annual or bi-yearly averages of breeds and for the consideration of standards as well.

Training(of method) is easy, rapid is introduction, and is good up until the point, when for instance conditions for the introduction of the BLUP method is created.

SUMMARY

Progeny tests of hereditary traits for beef production of pedigree bull started in 1974 in Hungary. The classification of pedigree bulls the average daily gain, daily carcass yield, live animal scoring and killing out percentage had more important role. Our system created on the basis of 956 pedigree bulls and 18061 offspring.

We improved a simple index for high quality estimation of the breeding value of the pedigree bulls with the above mentioned production traits in different breeding goals.

The application of method is easy and fast, rapid introduction and is good up until the point, when for instance conditions for the introduction of the BLUP method is created.

ZUSAMMENFASSUNG

Die Prüfung von Zuchtbullen auf die Heritabilität ihrer Fleischproduktion wurde in Ungarn von uns in 1974. begonnen, In der Bullenbeurteilung erhielt die Körpermasse- und Knochenfleischproduktion, Formpunktzahl sowie das Prozent der Fleischhausbeute eine wichtigere Rolle. Unsere Methode wurde nach diesen Gesichtspunkten, aufgrund der Angaben von 956 Zuchtbullen bzw. auf den der 18061 Nachkömmlinge entwickelt.

Es wurde ein einfacher Selektionsindex gebildet, der unter Berücksichtigung der bereits angeführten Leistungsmerkmale- auch bei anderen Selektionszielen- für die Zuchtwertschätzung von Zuchtbullen mit hoher Genauigkeit geeignet ist. Die Anwendung der Methode ist leicht und schnell und wird solange bestehen, bis die Bedingungen der Einführung der moderneren BLUP-Methode geschaffen werden können.