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Conference paper

BREEDING STRATEGIES FOR SIMMENTAL FLECKVIEH FROM THE POINT OF VIEW OF BREEDING ASSOCIATIONS

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Breeding aim

The economic conditions and the subjective opinion of breeders call for breeding programs that surpass pure performance and index breeding. For the definition of the breeding aim essential progress was made by means of the introduction of the total breeding value (GZW). Taking the breeding progress of all recordable traits into account permits a further development towards a biologically balanced breeding aim and an objective evaluation of all functional traits instead of recording merely performance. Especially the total breeding value emphasizes the outstanding variety of performance of Fleckvieh. Nevertheless, a slight decline in productive life also for Fleckvieh is noticeable.

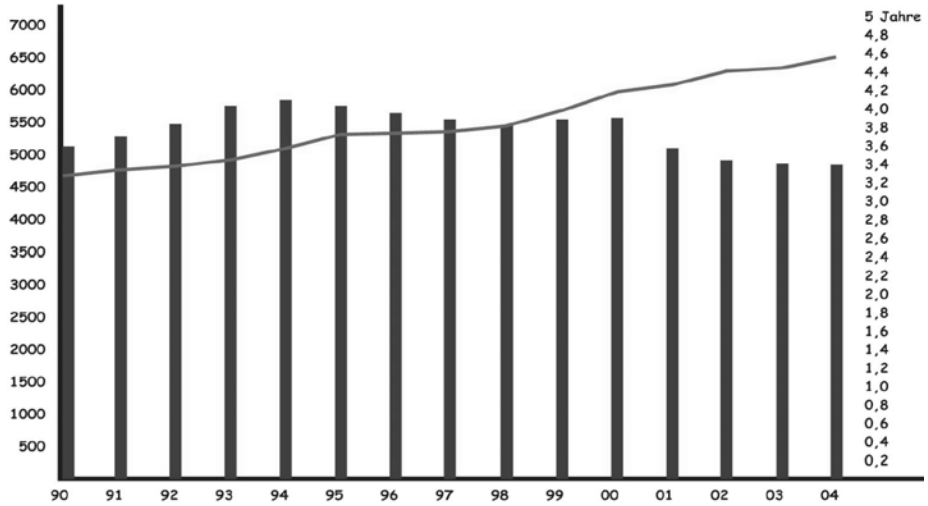

Figure 1 - DEVELOPMENT OF MILK PERFORMANCE AND PRODUCTIVE LIFE IN LOWER AUSTRIA (1990 to 2004)

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The wish for unproblematic, healthy cows is as old as organized cattle breeding. Quotation by Prof. Dr. Vogl, Munich 1906: "It is breeding for performance if it is practiced in a most unbalanced way knowing no bounds, yet, still sought to be enhanced that undermines the health of many breeding animals already in the womb and from early childhood on." A breeding association as representative of breeders therefore demands breeding strategies that have to take health, fertility and above all also type as a further health trait into consideration. Naturally, a breeder does at the same time not expect a reduction of milk and beef performance. This is going to be the future challenge.

Reliability

Supra-regional testing of bulls

The improvement of the validity of the testing is one of the most important demands for the future. The breeders will lose faith in our expensive methods if the top list turns out to be a flop list 3 years later. A wrong understanding of competition leads to high insemination figures of sires that in terms of total breeding value rank most highly on the top lists. Much too often disappointment concerning type or performance reliability follows. Mistakes made with other breeds must not be repeated with Fleckvieh. In this respect the synchronous testing carried out in two or more populations represents an alternative. The possible influence of local population effects decreases and the evaluation of the type traits is carried out by organizations independent of each other. As a consequence the results will be more readily accepted in both countries in which the testing is carried out. In an analysis of the breeding values of a second insemination the bulls of these supra-regional programs attract particularly positive attention.

Insemination with test bull semen for the second calf

In Austria this system is most commonly used. The advantages are the offspring of the testbulls in all herd classes as far as performance and environment are concerned. The descendants represent the entire genetic spectrum of a population and admit a more distinct conclusion concerning the heredity performance of the bull especially regarding the traits of muscularity and udder. In the control year of 2004 73.3 % of the first-calf cows were inseminated through testbulls in all Austria. This percentage varies from 29.7 to 89.6 % for different breeding organizations.

Table 1 - NUMBER OF BULLS OF THE STATION WIESELBURG TESTED SUPRA-REGIONALLY 1978 – 2004

Year	Number	Owner
1978 - 1983	23	Wieselburg, Meggle, Oberösterreich, Landshut
1984	12	Wieselburg, Meggle
1985	12	Wieselburg, Meggle
1986	9	Wieselburg, Meggle, Landshut
1987	8	Wieselburg, Meggle
1988	10	Wieselburg, Meggle, Landshut
1989	7	Wieselburg, Meggle
1990	9	Wieselburg, Meggle, Grub, Bauer, Landshut, Marktredwitz
1991	11	Wieselburg, Meggle, Landshut
1992	15	Wieselburg, Meggle, Grub, Bauer, Landshut, Marktredwitz
1993	17	Wieselburg, Meggle, Landshut, Plemenari Brno
1994	27	Wieselburg, Meggle, Landshut, Hessen
1995	28	Wieselburg, Meggle, Landshut, Marktredwitz
1996	33	Wieselburg, Meggle, Eusema, Irland, Frankreich, Hessen, Landshut, Marktredwitz, Würtenberg, Salzburg, OÖ
1997	36	Wieselburg, Meggle, Landshut, Eusema, RZO, Oberösterreich, STMK
1998	63	Wieselburg, Meggle, Eusema, Hessen, Marktredwitz, RZO, FIH, OÖ
1999	80	Wieselburg, Meggle, Eusema, FIH, Irland, Frankreich, Oberösterreich
2000	95	Wieselburg, Meggle, Eusema, Oberösterreich, Neustadt, FIH, Frankreich
2001	79	Wieselburg, Meggle, Eusema, Höchstädt, Oberösterreich, Irland
2002	85	Wieselburg, Meggle, Eusema, Italien, Genetic Austria, Frankreich, Plemo
2003	120	Wieselburg, Meggle, Höchstädt, Neustadt, Italien, BVN, Eusema, Genetic Austria, Frankreich, Plemo
2004	66	Wieselburg, Meggle, Höchstädt, Landshut, Italien, Eusema, Genetic Austria, Irland, Plemo, Frankreich

Higher numbers of testbulldaughters

A higher number of testbulldaughters can only be achieved by means of an increase in the percentage of testbull inseminations and a decrease in the number of testbulls. Yet, the breeding progress and the marketing of breeding livestock requires a minimum percentage of tested and selected bulls of 70 % of the insemination figures. For this reason it is necessary to improve the proportion of the daughters available for breeding value estimation before taking this step. This proportion is 10 : 1 in the ideal case, that is to say 500 inseminations lead to 50 daughters with first lactation and should not fall short of 15 : 1. The best possible number will be 100 – 150 daughters in a combined supra-regional recording. 200 – 300 daughters, a figure repeatedly demanded

by scientists, is not feasible, as the acceptance of the use of testbulls would decrease within breeders.

Second evaluation of tested and selected bulls in selective mating

The corresponding evaluation of testbulldaughters after the 3rd calf ought to be intensified further and also integrated into breeding value estimation. The remaining rate is to be regarded as part of the functional traits.

Economic efficiency

The costs of the breeding programs have to be financed by means of the price of semen and the (herd-book) registration charges. Independent performance recording is an indispensable condition in order to get reliable breeding values. The maintenance of exhaustive performance recording is one of the most important challenges in Fleckvieh breeding, which is due to the fact that it is mainly marked by small herd sizes. Public subsidies are to be seen as direct support of a sustainable cattle breeding. This is why it will be impossible to do without them also in future. The technical possibilities that the modern milking technology provides as well as electronic data transfer must be employed further in this field. Apart from that regional units have to be brought together in breeding programs. Structures that permit the use of the best sires of all Simmental Fleckvieh populations worldwide have to be built up. Especially

Table 2 - TESTING PROGRAMS IN COMPARISON

	Fleckvieh AUT	Fleckvieh BRD	Sbt BRD	USA	Canada	Frankreich	Holland
First inseminations	763.830	1.987.709	2.432.312	7.300.000	900.000	2.596.000	1.190.000
No of testbulls	181	680	900	1.469	409	660	350
Total proportion of first inseminations (FI) (no of) testbulls	4.220	2.900	2.702	5.000	2.247	4.000	3.500
No of artificial insemination organizations	6	12	16	9	7	34 Regioz-enter	3
No of breeding programs	6 (1)	12	14(4)	5	2	2	2
First inseminations per breeding program	127305 (763.830)	165.642	173763 (608.000)	1.460.000	750000 Semex	1.300.000	970000 HG
No of testbulls per breeding program	30 (181)	56	76 (225)	299	350 Semex	330	320 HG

Holstein breeding has shown how the breeding progress is enhanced by means of global cooperation so that the breeding programs become important economic factors. The Simmental Fleckvieh countries of Central, Eastern and Southern Europe have to be integrated into the Simmental Fleck-vieh community even more strongly. Also the established methods of breeding value estimation and data acquisition should be available in all countries as soon as possible in order to make a consistent Simmental Fleckvieh breeding standard feasible.

Enhancement of success

Embryo transfer

The efficiency of breeding programs contributes essentially to their economic success. The practice of embryo transfer is indispensable for an efficient breeding program. In recent years a decline (in embryo transfer) caused by low prices of breeding livestock and legal problems with veterinary drugs (the registration of FSH) was noticeable. Breeders frequently placed too great hopes in this technique for their own breeding farm, although the disappointment of breeders was often due to the selection of the wrong embryosires. However, with bulldams the practice of embryo transfer is meaningful in any case. Especially the connection with marker-supported selection opens up new possibilities in this field.

Table 3 - EMBRYO TRANSFER WITH DONOR COWS OF VARYING FERTILITY IN LOWER AUSTRIA

Category	Average no of usable embryos	Average no of not-inseminated + degenerate embryos
Old cow (not productive any more)	1,40	2,60
Cows without fertility disorder	6,98	5,68
Cows with one fertility treatment	5,58	6,53
Cows with repeated fertility treatment	2,74	6,35

Marker assisted selection

If the knowledge about vital genetic is available, marker assisted selection absolutely has to be integrated into breeding programs. In this connection especially genes concerning protein yield or fitness traits are of interest. The selection of several full-brothers generated by embryo transfer by means of

genetic markers would open up new breeding possibilities. In order to realize this a tight breeding program and the cooperation of all Simmental Fleckvieh populations would again be necessary.

Stationary recording of bulldams

In the European Simmental Fleckvieh population this possibility has not yet gained acceptance. The emerging costs can only be born by rather big organizations and with the background of global marketing possibilities. The advantages over the selection in many breeding farms emerge from higher performance reliability and better observation possibilities of bulldams with regard to somatic cell count and fertility. As with marker assisted selection also for this method international cooperation is required. An open nucleus-system with bulldam recording organized by contract in private breeding farms could be most easily realized.

Multifunctionality

Because milk performance is not the only advantage the Simmental Fleckvieh breed has to offer, with this breed more than with others a variety of traits has to be taken into account. Out of this a substantial superiority of Simmental Fleckvieh in competition might develop.

Type traits

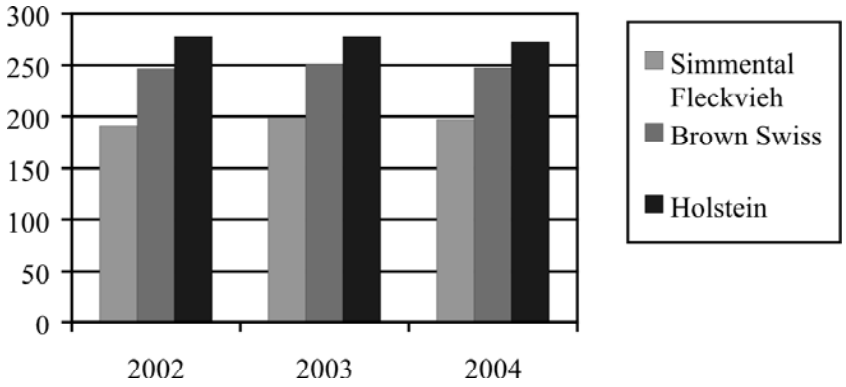
Apart from the satisfaction of the breeder's eye these traits serve especially the enhancement of health and fertility. The condition for a perfect type is the skeleton, which in spite of an increase in body size and growth rate, has to remain in a certain anatomical balance. Owing to the morphogenetic breeding of the recent 100 to 150 years Simmental Fleckvieh has a first-rate constitution of the spine, pelvis position and articular development. The external evaluation that restricts itself to the side view does not take the possibilities of a Simmental Fleck-vieh cow into account. With Simmental Fleckvieh also the "third dimension" has to be included. Its outstanding body width, an extraordinary chest and pelvis capacity amount to the same biological result in terms of feed conversion and functioning of organs as the long and wide rib vault demanded of the dairy breed. In 2004 about 450 young cows (approx. 6 weeks after their calving were measured for the chest with. The average result was 51,9 cm. The average pelvic with of 53,8 cm was determined in the linear description done for the type evaluation. Both measurements present the actual

standard for Fleckvieh in Lower Austria. Some catching up will be required in Simmental Fleckvieh breeding concerning keeping the quality of udders. Breeding value top lists frequently force sires that are distinguished by excellent udder heredity onto the sidelines. In this respect a higher weighting of udder quality in the ranking of sires is required.

Somatic cell count

With increasing performance the somatic cell count becomes a problem also for Simmental Fleckvieh. However, since it is not by definition linked up with milking speed and milk yield there exist promising future selection possibilities. The advantage of Simmental Fleckvieh in this health trait must not be lost. The breeders do not understand the high weighting of ancestry performance in breeding value estimation concerning the somatic cell count or type, because the breeding values differ substantially from the absolute values. In the search for new bull sires the problem that the same bloodlines keep managing to predominate arises. Concerning their use as bull sires it would certainly be revealing to evaluate the sires according to their absolute values for functional traits.

Figure 2 - SOMATIC CELL COUNTS OF THE DIFFERENT BREEDS IN LOWER AUSTRIA 2004



Beef performance

This vital merit of the Simmental Fleckvieh breed has been neglected in the breeding process in recent years. Apart from the fact that the marketing of cows and calves provides an additional source of income in the course of milk production, beef performance is also part of the health and morphological

traits. Due to the extraordinary muscularity of a Simmental Fleckvieh cow an extraordinary metabolic stability in situations of strain is to be expected. Nevertheless, it does not make sense to evaluate beef performance with young cows at the beginning of lactation by means of muscularity. To practice beef performance recording data from performance testing of breeding bulls (illustration 3) and from progeny testing must be used.

Fertility

Fertility problems are becoming one of the most cost-intensive factors in dairy husbandry. This gradually proceeding negative trend in connection with a substantial enhancement of milk performance has to be stopped. In order to increase the heritability in this trait data acquisition has to be improved (Sölkner and Egger-Danner, 2003). The selection for maternal fertility is becoming increasingly important, which would require its higher weighting in the total breeding value. Additionally, half-subjectively recordable traits, such as the intense of the heat, should be integrated into the fertility breeding value.

Figure 3 - DEVELOPMENT OF DAILY GAINS OF YOUNG SIM-MENTAL BULLS IN THE (OWN-?) PERFORMANCE TESTING STATION OF ROSENAU (1984 – 2004)

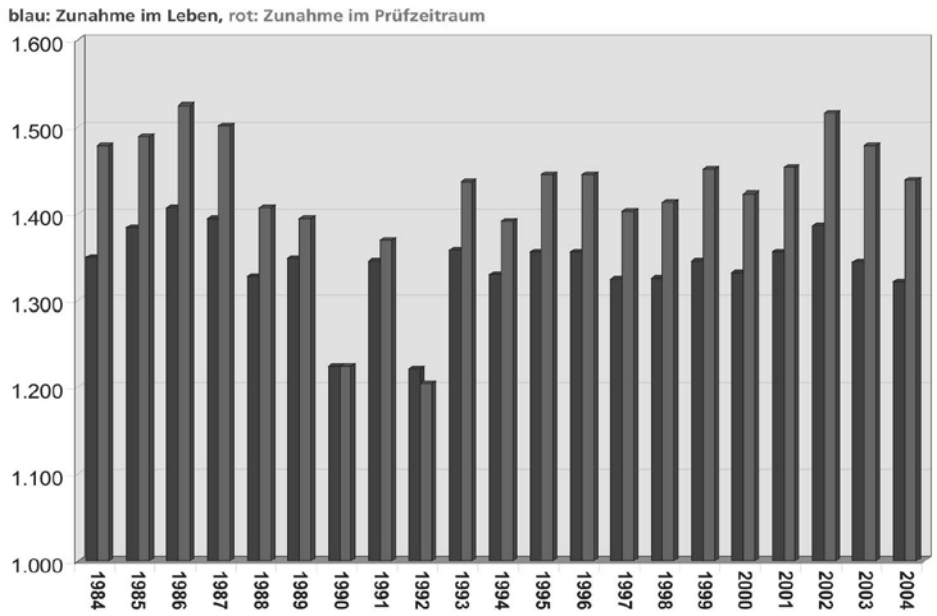
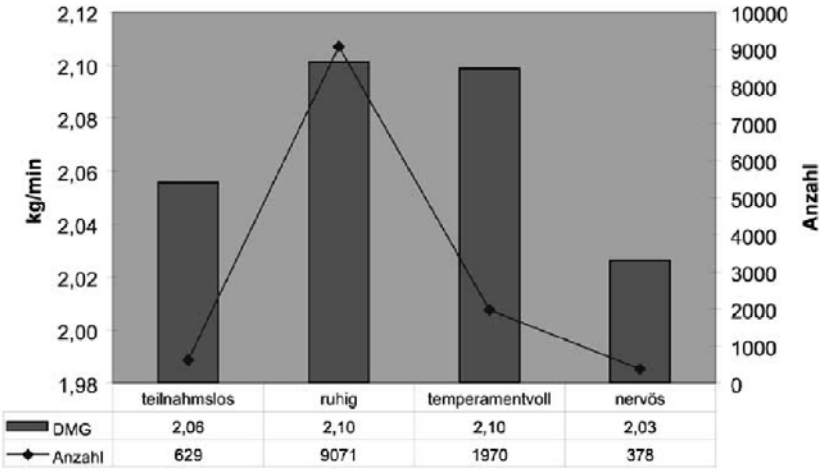


Figure 4 - CONNECTION BETWEEN TEMPER AND MILK RATE



Temper

For an unproblematic dairy husbandry the cows absolutely have to have a quiet temper. For this reason the integration of this trait in breeding value estimation has to be possible in future. Provisional research has shown a significant genetic effect with temper and milking behav-iour.

Transparency

The calculation of an index has to be transparent also for breeders and dairy farmers. The high weighting of ancestry performance and the taking into account of correlations between individual breeding values lead to breeding values that find no sympathy with breeders and farmers. The actual observations are going to be of continuing interest to those doing the practical work and should be allowed to be evaluated for the selection of bulls, especially in selective mating. Apart from that the narrowing of bloodlines is encouraged by linear index selection.

Conclusion

Simmental Fleckvieh is the most multifarious cattle breed globally. The breeding programs have to take this into consideration and to guarantee the highest measure of reliability. This is permitted by the technical possibilities of

our time. One condition is the worldwide cooperation of all Simmental Fleckvieh countries in the realization of breeding programs, as this has already been demonstrated with other global cattle breeds. In particular the Simmental Fleckvieh countries of Central, South and East Europe have to be integrated into this cooperation. If we do our work persistently and pay attention to the balance of nature, Simmental Fleckvieh will continue to grow in importance globally.

UZGOJNE STRATEGIJE ZA SIMENTALCA FLECKVIEHA SA STAJALIŠTA UZGOJNIH UDRUGA

Sažetak

Simentalac Fleckvieh je najmnogovrsnija pasmina goveda u svijetu. Uzgojni programi moraju to uzeti u obzir i jamčiti najveću mjeru pouzdanosti. To dozvoljavaju današnje tehničke mogućnosti. Jedan je uvjet suradnja svih zemalja u svijetu u ostvarivanju uzgojnih programa, što se već dokazala s drugim pasminama goveda u svijetu. Osobito se zemlje Simentalca Fleckvieha srednje, južne i istočne Europe moraju integrirati u ovu suradnju. Ako ustrajemo u radu i obratimo pozornost na prirodnu ravnotežu popularnost Simentalca Fleckvieha će i dalje rasti širom svijeta.

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