Testing of production performance in seven different genotypes of fattening pigs

Results of the IX. test of the production performance of fattening pigs performed in 2008, published in a Wochenblat Westfalen-Lipe weekly, and performed at the Landwirtschaftszentrum Haus Düsse
(control report)

The vast majority of the northwest German breeding stations breed pigs of hybrid combinations. Selection between the various products, both in case of farmers of piglets, and feed manufacturers, points out to objective and neutral differences identified in production performance. In addition to the performance parameters of fattening, the evaluation carcasses and meat quality is also important, as well as the level of fertility and the supply of service provided by breeding organizations.

Based on the request of the Landwirtschaftliches Wochenblatt Westfalen-Lippe weekly, the agriculture chamber of the North Rhine-Westphalia (NRW) carried out a test of feed compounds for piglets, in accordance with standard DIN 66052 and the directive of German pig farming association for the fattening value control. The test was performed with regard to experience gained from eight previous evaluations. The current ninth test was launched by piglet testing in April 2007 .

As an example of substantial innovation, it is worth mentioning the introduction of the meat drop loss value as an important factor for its application on the market, as well as the monitoring of performance parameters in sows.

Test performed on 7 genotypes

The selection of hybrids for testing purposes was carried out with regard to market representation, and to the results of previous tests. (List no.1). The test was carried out at seven breeding organizations:

- Züchtungszentrale Deutsches Hybridschwein, Dahlenburg-Ellringen (BZHP)
- Dansk Svineproduktion, Kopenhagen (DanZucht-DanAvl)
- Hülsenberger Zuchtschweine, Pinneberg (Hülsenberger)
- JSR Hybrid Produktion und Vertrieb Hirschmann, Gescher (JSR)
- Landesverband Rheinischer Schweinezüchter, Meckenheim (LRS)
- PIC Deutschland, Schleswig (PIC)
- Topigs, Senden-Bösensell (TOPIGS)

The father of all tested piglets was a boar called Pietrain.
104 animals were tested for each hybrid, half of them gilts, the other half neuters. All animals were housed on slatted floors. The first half was freely fed from automatic feed dispenser in doses, starting from 70 kg of live weight. Dose feeding was carried out daily by a one-off supply of feed. In addition to the weight monitoring, close attention was paid to gender and eating behavior as well. The feed consisted of standard LPA pellets containing 13,6 MJ, ME and 11,3g of lysine per 1 kg of feed. The average weight at housing was 23,2 kg. Duration of the test corresponded to a mass interval ranging from 30,0 to 121,1 kg

of average live weight. All production performance parameters were recorded individually for each animal. Stocking for the first test was carried out in April 2007, for the second in October 2007.

Details on the Methodology

Least squares index method was used for the purposes of the productivity data evaluation (LSQ method). This procedure makes it possible to take into account unequal distribution (number of evaluated animals) in the various groups subjected to the test. In addition, it is also possible to take into account influential systematic factors. The model also included the influence of respective hybrid combinations, tendencies, feed groups, gender and previously tested interaction on the production performance, carcass and meat quality values. In addition, the meat quality values were adjusted to a certain day of slaughter.

The model used to determine the influence of the differences among the individual hybrid combinations on their production performance included the influence of the genotype itself, the number of births, size of the breeding point, influence of a particular season and other previously verified types of interaction. Influence of the 'sow "as such was considered as random given the repeated productivity performance relevant to one sow.

There was a total of 401 piglet breeding centers available for random sample collection. Out of these, the staff of the NRW Agricultural Chamber NRW selected 162 centers for the acquisition of piglets in accordance with the principal of randomness. Piglets selected for the purposes of the test were selected out of the total of 136 breeding centers from the north-east Germany. At these breeding points, two neuters or two gilts were selected out of each birth group and identified by an electronic chip. The selection of random samples in both cases was carried out independently of one another. All the 104 tested piglets in each combination came from at least 62 different mothers or at least 31 different fathers. According to relevant documents, approximately 4,9 % of these piglets were born (ranging from 0 to 10,6 %) by natural breeding, and approximately 95,1 % of the piglets (89,4 to 100 %) were born by artificial insemination.

Excellent productivity performance of fattening pigs

The average daily weight increase amounted to 887g exceeding the evaluation results gained from the previous testing conducted in 2001/02 by 23g (List 2). The range between the highest value of the parameter (DanZucht 942g) and the worst result amounted to approximately 90g. DanZucht affirmed its leading position even from the point of view of carcass values with its net daily increase value of 695g. Statistically speaking, the same level of daily increase values were reached by the Hülsenberger breed with its daily increase value of 906g, and net daily increase of 633g. Average values of LRS, TOPIGS, PIC and BZHP were relatively close to both of these hybrids. The last ranking position belongs to JSR, in spite of a very small difference in value, whose net daily increase amounted to 604g. These values point out to a difference of 9 days in the fattening period at DanZucht and JSR breeding stations.

The consumption of animal feed per 1 kg of weight increase given the average value of 2,54kg, ranged between 2,43 to 2,58 kg. The net animal feed consumption per 1kg of weight increase parameter, given the average value of 3,6kg, showed the value of 0,1kg, which is a notable improvement compared to the feed testing of 2002 (3,7 kg). There is a statistically significant difference between the best scoring station (DanZucht), and the remaining sta-

tions (BHZP, JSR, PIC, LSR, TOPIGS). Production performance data given the daily feed intake values corresponds with average results of daily intake in case of JSR in particular.
The experience from the agricultural center Haus Düsse in particular, showed that the assessment of carcass values shall also take into account the fact, that the animals were weighted after the last feeding, being taken to slaughter the next day, i.e. without being able to digest the fodder. Therefore, the average value of 77,8 % after the removal viscera is about 1,5 to 2 % under regular values in practice (List 2).

Carcass Values

Assessment of carcass values was first conducted in accordance with the parameters defined for slaughterhouse halves determined by the LPA directive : back fat and brisket height, chop surface area and percentage of fat. The use of this method, which has not been altered for year makes it possible to compare and evaluate the results in terms of a longer period of time.
Whilst in case of the back fat the values were found to be identical for all breeds, the planimetrically determined chop surface area showed a considerable difference of 4,3 cm^2. The biggest chop of 57,8 cm2 came from JSR animals, the smallest 53,5cm2 chop came from TOPIGS.
As for the proportion of meat to fat, JSR is at the top, followed by DanZucht and the others-Hülsenberger, BHZP, LSR and PIC. The TOPINGS animals fell behind JSR by 0,05. Similar results were shown when comparing the proportion of muscle tissue determined on slaughtered animals by the Autofoam method. Also here, the JSR has a leading position, from the statistical point of view however, its results are equal to those of Danzucht, followed by Hülsenberger, BHZP, LSR a PIC.This ranking was even reaffirmed during the analysis of ram and chop parameters by the Autofoam method. The rump weight of JSR animals (18,4 kg) exceeded the rump weight of TOPIGS(17,7 kg). by 0,7 kg.
The importance of evaluation of the abdominal part of the hull has gained in importance in the past. Upon the application of the Gruber empirical formula defined in the LPA directive for the determination of the percentage of meat contained in the brisket, the JSR and Hülsenberger breeding stations were at the lead with its 58,8 and 57,9 %. TOPIGS found itself at the bottom of the scale with its 56,3 %. Other combinations are more less on the same level with its 57,4 , and 57,5 %.
Similar results were gained while determining the percentage of meat in the brisket by the Autofoam method (%). The resulting values were not absolute due to the influence of the fact that a different method was used, which is however similar to the values calculated on the basis of the LPA formula. Nevertheless, the values of the combinations were almost on identical levels.

Autofoam method models

The various calculation models of the Autofoam method used at various slaughterhouses on the market differ both in the evaluation factors for the parts of the hull, rump, chop or brisket, and in other limitations of the system (among others the restriction on carcass weight, minimum index points at various slaughter weight classes, and the upper limits of the system). For the assessment of the tested animals according to the "carcasses within the norm of various calculation models" criteria, it is necessary to take into account the fact, that the

animals were put on the market with the goal of keeping their carcass weight on a similar level, if possible. The so-called mask effects are therefore only conditional.
Based on the Westfleish calculation model, on average 92 % of the chop carcasses falls into the standard range of (6,2 to 7,8 kg). The percentage ranges from 87 % at TOPIGS to 94 % at Hülsenberger (List 2). Particularly remarkable is the 12 % of carcasses at TOPIGS, where a chop weighed less than 6,2 kg. The hull parts are then assessed only by factor 2,8 instead of factor 3,5. For the chop part of the hull the alternative Tönnies and Vion models are almost identical. As a "punishment" for a chop weight lower than 6,2kg, the factor is reduced to 2.8. This is almost identical with the Westfleisch option.
In case of ramp meat, the Westfleisch, Tönnies and Vion calculation models show insignificant differences in the standard range with the highest evaluation factor. The maximum factors are also different. In case of the Westfleish variant, 89 % of all slaughter hulls falls into the standard range (16 kg to 20 kg; factor 2,3). The range is from 87 to 93 %. The Tönnies showed a significantly lower number of interventions (ranging from 67 to 85 %), due to a somewhat lower level of the standard range (15 kg to 19 kg; factor 2,4) with an average of 74 %. The Vion model values lie somewhere between them (standard range of 15 kg to 19 ,5 kg; factor 2,3).
In order to exclude these effects during the classification of slaughter hulls, and regardless of the system limitations, the comparison of hybrids was carried out by comparing the Autofoam index points per 1kg of slaughterhouse weight (IXP/kg SG) according to the Westfleisch calculation model. (List 2).
With the value of 1,048 IXP/kg , the JSR scores 0,026 points above the TOPIGS. Given the assumed value of carcass weight of 94kg and a price factor of 1,36 € /index point valid at the time of slaughter, the difference in revenue calculation amounts to € per hull.
The same calculation according to the Westfleisch model, with regard to the system limitations, shows a difference in revenue amount to 4,50 € per hull.
System limitations have no influence over the actual ranking of the tested combinations, regardless of their leading or last ranking positions. There is a possibility of that the rankings being interchangeable, however only in the middle of the ranking scale. Comparison of combinations while using different calculation models does not show any remarkable shifts in the ranking order, given the limitations of the system.

Meat Quality

In comparison to the tests conducted in the past, the marginal values which, if reached, led to the necessity to test the meat as meat of a very good or good quality, were made stricter. While in the past, good ranking was determined by the pH value of pH_1 6,0, it currently lies on a threshold of ≥ 6,2. In case of $pH_{24,}$ the previous value will decrease from < 6 to < 5. For this reason, the proportion of hulls of a very good and good quality are not comparable with previous measurements any more.

Comparison of the absolute values of pH_1 and of the values of pH_{24} confirms the improvement in meat character in all tested combinations. The average pH_1 value of 6,59 was 0,39 points below the values gained in the last measurement. The pH_{24} value showed an improvement of 0,6.
Despite a certain tightening of the classification conditions, it was possible to classify 92 % of the animals of all tested breeds in terms of the pH_1 value, and 93 % of the animals in terms the pH_{24} value as a group with a very good or good meat quality. 89 % meet both criteria (Overview (3).

As for the sensory parameter, all animals were tested for the content of intramuscular fat in the chop area (IMF) by using the (NIT) method - transmission in the infrared area. In case of this parameter, the value of 1,02 % shows a minor deterioration. The hybrid range measured on the basis of an indicative value of (2 %), which, if exceeded, should be a sign of the improvement of sensory characteristics, is very narrow ranging from 0,92 to 1,07 %. Results of measurement achieving more than 2 % of the IMF value fall into a range from 0,4 to 3,5 %.
The meat juice loss parameter was included for the first time during this test. Its value was measured by differential weighing on two test samples of chops. The loss of meat juice means the loss of weight, which makes it an important criterion for the application of meat on the market. In addition, the meat juice loss parameter points out to the loss of the sensory quality of meat (its juiciness).
Meat juice losses scoring under 2 % were evaluated as good, and values between 2 and 4 % as satisfactory.
Given the average value of meat juice loss of 2,47 %, the tested animals score slightly above the indicative value, which is still considered as good. The worst value of 3,21 % was recorded in animals of the JSR combination. BHZP and TOPIGS animals took the lead in the ranking scale with a value of 2 %.
Further on, the MHS-Gen test was applied for the measurement of stress resistance. At the beginning of the testing interval, a sample of ear tissue was taken from each animal. Compared to the previous halothane test, the MHS allows us to determine the difference between the stress-resistant homozygotes and heterozygotes.
With the exception of 3 animals of the LRS breed, all the rest was classified as phenotypically resistant to stress (List 3). The number of heterozygotes (Nn), with the exception of LRS (37 animals) and TOPIGS (17 animals) ranged from 21 to 25 animals.

Productivity Performance of the mothers of the tested hybrids

For the first time this time, the productivity performance was determined also with regard to the reproduction analysis of the tested herds. In the past, the number of piglets in the respective pig stalls was determined on the spot during the analysis, and presented an important indicator for the comparison of hybrids. The 2001/2002 test proved the practicality of this method.
The staff of the Agricultural Chamber also included the data from 195 breeding stations for the period from June 2006 to March 2008 into the assessment.
In addition to the origin and the size of the herds, the assessment also recorded reproductive indicators together with other details such as information on diseases, which may have had an impact on the fertility of the affected animals.
According to their origin, the assessment included data on sows from 24 to 30 breeding stations. The average size of a herd was 279 sows, ranging from 230 to 364 pieces. A total of 79.036 births were recorded in the interval ranging from 6006 to 14927 births according to different genotypes.
The average parity of the tested sows was less than 3 births in case of BHZP and DanZucht, and 3,6 in case of TOPIGS. For the other combinations from 4,1 to 4,3 births.
With the average of 13,63 of live births, the DanZucht hybrid affirmed its leading position on the ranking scale. (List 4). The second place, with a statistically significant distance from the first (1,32 of live births), belonged to TOPIGS with 12,31 piglets. BZHP, Hülsenberger, JSR and PIC were placed somewhere in the middle of the ranking scale. The LSR breed found itself at the bottom of the scale with 11,43 of live births. For the interpretation of the assessed indicators, such as the number of weaned piglets in the litter and the number of losses piglets

per litter, the impact of the management of the respective breeding stations has to be taken into account as well.

Customer satisfaction

For the second time a survey was conducted into the satisfaction of the respective livestock farmers with the service provided by breeding organizations. In addition to the genetic production performance of animals, provision of services plays an increasingly important role in the purchase decision-making process.
The managers of 30 breeding points were asked questions during a personal interview, regarding namely the purchase of gilts, quality of the delivered gilts, complaint procedure and the quality of other services. The inquired livestock farmers could chose answers from the presented questionnaire.
Partial results were summarized into the summarized result and evaluated by the system of school grades. Marks slightly better than 2,0 were given to LRS, Hülsenberger and TOPIGS, followed by DanZucht, PIC and BHZP with grades ranging from 2,12 to 2,14. JSR found itself at the bottom of the grading scale with its 2,22 grade (overview (5).

Economic Evaluation

Economic calculation was performed based on the data concerning the production performance of the fattening animals, carcass values, meat quality and production performance of hybrids.
For the calculation of carcasses with the use of Autofoam classification technology, a rate of 1,36 € per index point was used ((net). This value reflects the average sales revenue for the time period during which the animals from the second monitoring round were being sold. For the purposes of the mask effect reduction, regardless of the system limitations, the Westfleisch calculation system was used, reflecting on the situation as to January 2008 .
For the price of the feed , an average price valid at the time of the second monitoring round was used amounting to 28,74 € /100 kg (net). The revenue cashed at the respective slaughterhouses has to be used to cover the purchase costs of the piglets, as well as other costs incurred on energies, work, veterinarian services etc. Loss of animals during testing was not significant, therefore was not included into the economic evaluation.
DanZucht with its above-average price of 69,72 € per hull and excellent feed to weight conversion per 1kg of weight, scoring about 3,20€ above the average, and 6,24 € above the results gained by the TOPIGS animals, who were placed at the lower bottom of the ranking scale (List 6). JSR, Hülsenberger and LRS scored statistically on the same level like DanZucht.
The use of housing capacity was assessed from the economic point of view by the length of the fattening period. Thanks to the above-average weight increases and the corresponding smaller number of days of the fattening period, DanZucht a Hülsenberger gained additional 1,20 , and 0,40 € /animal. Deductions for the other combinations amounted to EUR 0,15 to 0,73 € /animal. The economic significance of the production performance of hybrids is the advantage of production costs on the weaning pigs. The value results from production performance parameters: live born piglets and losses to weaning. The average values of the hybrids were compared with the overall average and the differences were evaluated by individual items of the direct and constant costs.

The operational and economic assessment of the quality of meat was carried out according to pH_1 and $pH_{24,}$ and based on the ratio of carcasses with a very good or good meat quality. Each animal, who met both threshold values, gained in value by additional €5. The sum of all additional values was then applied on all the rest of the animals of a given combination.
In accordance with the operation guidelines, the amount of feed surpluses changes by reducing the number of days of the fattening period. (overview (7). Additional increases in the value of DanZucht animals fluctuate between 4,36 and 8,36 € /animal. Hülsenberger pigs gained an additional value increase of EUR 0,67 to 1,38EUR . In case of the other hybrids the total surplus compared to the average was reduced with regard to the length of the fattening period, and the productivity performance or meat quality of the hybrid, in the range of 0,41 - 3,25 €.

Total Evaluation

In accordance with principles of the test the results of the individual areas of productivity performance were first evaluated by the system of school grades. The determination of grades was carried out as much as possible according to the residual standard deviation, which was also used for the statistical evaluation of differences in the selected indicators. Except for the JSR, the other stations achieved “Very good," or "good" grades. JSR with its "satisfactory" grade somewhat fell behind with (List 8). The score of all hybrids in terms of the feed cost parameter came very close to one another. DanZucht genotypes took the lead again with their "very good" grade.
For the evaluation of carcasses, several parameters were taken into account such as the Autofoam value, meat to fat ratio, chop surface area and fat height. JSR stood out of the combinations with its "very good" grade, closely followed by DanZucht, Hülsenberger and LRS. BHZP and PIC scored in the middle of the scale, TOPIGS finished at the bottom of the scale with its "satisfactory" grade. Despite the tightening of the threshold values and the effects of the applied methodology, the overall result of the meat quality, except for JSR, was evaluated by grades ranging from "very good" to "good".
There was only one winner given the productivity performance of the various genotypes. Between the top-ranking DanZucht genotype (grade (1) and the LRS (grade (3) is a difference of 2,2 live births in a litter. Second place belonged to TOPIGS (grade (2). BZHP, Hülsenberger, JSR and PIC scored in the middle of the ranking scale with a "good minus" evaluation. This parameter showed a great improvement in comparison with the last monitoring. In the 2001/2002 test, the assessment of sows recorded an average of 10,81 live births per litter. Breeding and selective measures in the field of fertility her in all breeds has significantly moved towards higher values.
There were no significant changes recorded in the field of customer satisfaction, where the evaluation ranged from "good minus" to "good plus".
Table 9 shows grades gained by all seven tested genotypes for the individual parameters. To sum up - the closer the points or the line is to the center, the better the evaluation of the genotype.
As the last step, individual grades were summarized into a total grade. The importance of the range of the seven parameters was determined with and without regard to the production performance of the hybrids. This way, the subject of focus of the specialized breeders was also taken into account, i.e. herds with sows and on the other hand sole pig fattening stations.
Given this evaluation, DanZucht genotype with its "very good" grade (1,3) was proclaimed the winner of the 9th (ix) test of production performance parameters of pigs, regardless of

the inclusion or exclusion of the performance productivity of hybrids and the customer satisfaction values. (List 8). Other genotypes fell behind being graded as "Good." On closer inspection, significant differences may be seen in the individual parameters of evaluation, at the level of approximately half of one grade.
The positive overall the result of this test confirmed a good level of breeding at all observed stations. The results of these tests may force some genetic engineers to make further effort for the improvement of their situation given the competitive nature of this business.
This improvement in breeding work will eventually bring benefits to livestock farmers, as well as their customers and consumers.

- *The results described hereof are a summary of data obtained during the testing of fattening piglets. Detailed report including all individual results of the test are available as a record no.29" of the record file on the testing of goods" in the form of CD media for 9,50€, including the postal fees, and can be ordered at the Agricultural Chamber of North Rhine-Westphalia Nevinghof 40, 48147 Münster, phone no. (02 51) 23 76-857 , fax 23 79-869.*

① Seven genotypes of the 9th test of production performance parameters of fattening pigs

Breeding organizations and their products of controlled breeding i.e. breeds of hybrid origin

Genetics	BHZP	DanZucht	Hülsenberger	JSR	LRS	PIC	TOPIGS
Boar	Pietrain	Pietrain	Pietrain	Pietrain	Pietrain	Pietrain	Pietrain
Sows	Db-Naima	Danhybrid	Hülsenberger LW x LL	Gena 90	Rhein - hybrid	Cambo - Rough23	TOPIGS 20

② Parameters of production performance of tested animals

Production performance in the fattening herd and carcass parameters

Genetics	BZHP	Dan Zucht	Hülsen berger	JSR	LRS	PIC	TOPI GS	Aver-age
2.1 . Production performance in the fattening process								
Daily increase g	877	942	906	851	875	875	878	887
Net daily increase g	614	659	633	604	623	615	619	624
Animal feed consumption per 1 kg of weight increase kg	2.58	2.43	2.51	2.58	2.56	2.55	2.58	2.54
Net Animal feed consumption per 1 kg of weight increase kg	3.68	3.48	3.59	3.64	3.60	3.63	3.66	3.61
Daily feed Intake kg	2.25	2.28	2.26	2.19	2.23	2.22	2.26	2.24
2.2 Description of carcasses								
Slaughter revenue %	77.5	77.4	77.4	78.3	78.4	77.7	77.8	77.8
Back fat height cm	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Chop surface area cm 2	55.7	55.4	55.8	57.8	57.4	54.7	53.5	55.8
Meat to Fat ratio	0.31	0.30	0.31	0.29	0.31	0.31	0.34	0.31
Share of muscle tissue according to Autofoam %	58.6	58.9	58.7	59.4	58.5	58.5	57.2	58.5
Rump - net value according to Autofoam kg	18.2	18.3	18.1	18.4	18.1	18.0	17.7	18.1
Chop value according to Autofoam kg	7.0	7.0	7.0	7.1	7.0	6.9	6.8	7.0
Meat share in the brisket (Gruber formula) %	57.4	57.4	57.9	58.8	57.5	57.5	56.3	57.5
2.3 Share of carcasses within the limits of the Autofoam system (%)								
Chop (kg) - Westfleisch								
< 6,2	4	4	3	3	1	9	12	5
6,2 – 7,8	93	93	94	91	92	90	87	92
< 7,8	3	3	3	6	7	1	1	3
Chop (kg) - Tönnies/Vion								
< 6,2	4	4	3	3	1	9	12	5
≥ 6,2	96	96	97	97	99	91	88	95
Rump-NET (kg) - Westfleisch								
< 16	5	3	7	3	8	6	7	5
16-20	87	90	87	88	87	89	93	89
> 20	8	7	6	9	5	5		0
Rump-NET (kg) - Tönnies								
< 15	2	0	0	1	4	1	3	2
15-19	70	67	78	70	69	77	85	73
> 19	28	33	22	29	27	22	12	25
Rump-NET (kg) - Vion								
< 15	2	0	0	1	4	1	3	2
15-19.5	83	83	88	80	82	85	92	84
> 19.5	15	17	12	19	15	14	5	14
Share of meat in the brisket (%) Westfleisch								
< 47	9	5	7	7	14	11	17	10
47-52.99	38	43	36	31	34	33	49	38
≥ 53	53	52	57	62	52	56	34	52

Share of meat in the brisket (%) - Tönnies/Vion								
< 45	5	3	1	4	8	7	11	5
45-50.99	23	19	31	20	25	21	35	25
≥ 51	72	78	68	76	67	72	54	70
2.4 index points/kg slaughter weight according to Autofoam								
Regardless of the system limitations								
Westfleisch 1/08	1.042	1044	1.041	1.048	1.040	1.035	1.022	1.039
With regard to the system limitations								
Westfleisch 1/08	0.993	1.001	0.998	1.002	0.990	0.988	0.967	0.991
Tönnies 1/08	1.000	1.005	1.003	1.006	0.998	0.992	0.976	0.997
Vion 2007	0.990	0.993	0.989	0.993	0.988	0.985	0.971	0.987

③ Meat Quality

Meat quality parameters (given as average values in hybrids, i.e. as a ratio of animals of a certain class) and the results of stress resistance

Genetics	**BZHP**	**Dan Zucht**	**Hülsen berger**	**JSR**	**LRS**	**PIC**	**TOPI GS**	**Aver-age**
Quality Parameters								
pH_1 value of chops	6.64	6.60	6.62	6.47	6.56	6.62	6.64	6.59
pH_1 Ratio ≥ 6,2 %	96	93	94	81	87	96	93	92
pH_{24} value of chops	3.1	3.2	3.2	3.6	3.3	2.9	2.9	3.3
pH_{24} Ratio ≥ 5 %	91	90	93	88	94	99	98	93
pH_1 ratio ≥ 6,2 and pH_{24} < 5 %	90	88	92	77	86	95	93	89
Meat juice drop loss	2.08	2.85	2.13	3.21	2.65	2.26	2.08	2.47
intramuscular fat content	0.99	1.00	1.06	0.92	1.09	1.07	1.07	1.02
Stress resistance according to MHS results (number of animals)								
NN - homozygotically stable	76	83	77	79	64	78	87	544
NN - heterozygotically stable	24	21	27	25	37	25	17	176
nn - homozygotically sensitive	0	0	0	0	3	0	0	3

④ Reproductive performance parameters

Results of reproductive performance of the tested hybrids

Genetics	**BZHP**	**Dan Zucht**	**Hülsen berger**	**JSR**	**LRS**	**PIC**	**TOPI GS**	**Aver-age**
The number of live born piglets/litter	11.74	13.63	11.70	11.75	11.43	11.80	12.31	12.05
Number of dead piglets/litter	1.71	1.86	1.55	1.74	1.52	1.99	1.48	1.69
Number of weaned piglets/litter	10.03	11.04	10.04	10.14	9.96	9.93	10.74	10.27

⑤ Satisfaction of the breeders

Results of the customer satisfaction survey (school grade system)

Genetics	**BZHP**	**Dan Zucht**	**Hülsen berger**	**JSR**	**LRS**	**PIC**	**TOPI GS**	**Aver-age**
Purchase of gilts 25 % *	2.2	2.3	1.9	2.2	1.6	2.2	1.9	2.0
Quality of gilts 50% *	2.1	2.0	2.0	2.2	2.1	2.2	2.0	2.1
Claims 15 %	2.1	2.2	2.0	2.3	1.0	2.0	1.9	2.1
Service performance 10 %	2.1	2.3	1.6	2.3	1.8	1.9	1.9	2.0
Total 100 %	2.14	2.12	1.94	2.22	1.93	2.13	1.98	2.06
* share of significance in the overall assessment								

⑥ Profitability assessment

Profitability assessment (irrespective of the system limitations, Westfleisch calculation model, as of January 2008), values given in EUR/animal

Genetics	**BZHP**	**Dan Zucht**	**Hülsen - Berger**	**JSR**	**LRS**	**PIC**	**TOPIGS**
Profit from the animal feed costs	65.54	69.72	67.37	67.44	66.82	65.45	63.48
Increases/deductions * for number of feeding days	-0.29	1.21	0.40	-0.73	-0.15	-0.31	-0.18
Increases/deductions * for performance	-1.20	3.84	-0.69	-1.17	-1.39	-1.95	1.51

Increases/deductions * for meat quality	4.49	4.42	4.60	3.87	4.32	4.75	4.66
Total profit (with regard to the number of feeding days)							
Regardless of the meat quality, and regardless of the productive performance of breeds	65.25	70.93	67.77	66.71	66.67	65.14	63.30
With regard to meat quality and productive performance of breeds	68.54	79.19	71.68	69.41	69.60	67.94	69.47
Regardless of the meat quality, with regard to the productive performance of breeds	64.05	74.77	67.08	65.54	65.28	63.19	64.81
With regard to meat quality, regardless of the productive performance of breeds	69.74	75.35	72.37	70.58	70.99	69.89	67.96

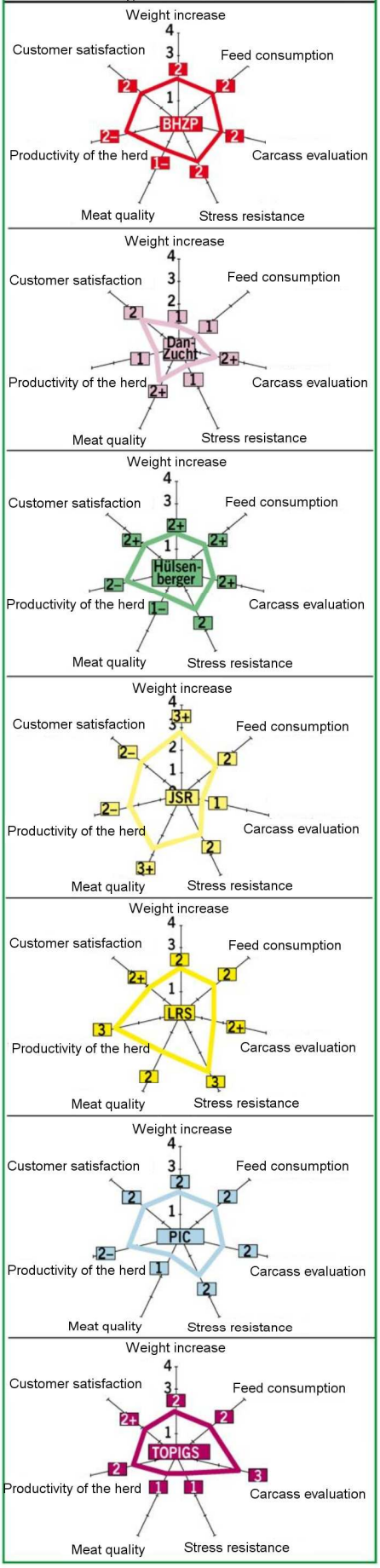
⑧ Strengths and Weaknesses

Assessment of the tested genotypes according to the parameters and the total evaluation mark

Genetics	**BZHP**	**Dan Zucht**	**Hülsen-berger**	**JSR**	**LRS**	**PIC**	**TOPIGS**
Individual parameters							
Weight Increase	Good	Very good	Good +	Satisfac-tory +	Good	Good	Good
Animal feed costs	Good	Very good	Good +	Good	Good	Good	Good
Carcass	Good	Good +	Good +	Very good	Good +	Good	Satisfac-tory
Stress Resistance	Good	Very good	Good	Good	Satisfac-tory	Good	Very good
Meat Quality	very good-	Good +	very good-	Satisfac-tory +	Good	Very good	Very good
Productivity Perform-ance of breeds	Good -	Very good	Good -	Good -	Satisfac-tory	Good -	Good
Customer satisfaction	Good	Good	Good +	Good -	Good +	Good	Good +
Total Evaluation							
Regardless of production performance/ Customer satisfaction	Good (2,0)	Very good - (1,3)	Good (1,7)	Good (1,8)	Good (2,0)	Good (1,9)	Good (2,2)
With regard to produc-tivity performance/ Customer satisfaction	Good (2,0)	Very good - (1,3)	Good (1,8)	Good (2,0)	Good (2,2)	Good (2,0)	Good (2,1)
With regard to produc-tivity performance/ regardless of customer atisfaction	Good (2,1)	Very good - (1,3)	Good (1,9)	Good (1,9)	Good (2,2)	Good (2,0)	Good (2,2)

9 Original of the individual evaluations

Evaluation of the respective areas of productivity (school grade system 1 = very good, 6 = unsatisfactory)



7 Variance in total revenue

Variance in total revenue in comparison with the average value (Euro/animal)