

Table 7. Average change in trait per year for pigs of each breed

Breed	Trait				
	Carcass length, in.	Backfat thickness, in.	Loin Eye area sq. in.	%Ham	Ham-loin index
Berkshire	.272**	-.012	-.060	.059	-.018
Chester	.211**	-.001	-.084	-.096	-1.652
Duroc	.362**	-.012	-.039	-.129	-1.767
Hampshire	.277**	.012	-.107	-.076	-1.773
Poland	.259**	.002	-.073	-.099	-1.712
Spot	.284*	.016*	-.183	-.254	-4.294
Yorkshire	.317**	-.010	-.187*	-.129	-3.121
Crossbred	.292**	.006	-.139	-.161	-2.932
Overall avg.	.284**	-.002	-.098	-.090	-1.854

* Average change per test is significantly different from zero, $P < .05$.

** Average change per test is significantly different from zero, $P < .01$.

The data from the barrows slaughtered in this show reveals a trend of longer pigs with less loin eye area, decreased ham percent, a decreased ham loin index and little change in backfat thickness except for the Spot breed. Although the barrows slaughtered in this show cannot be considered a representative sample of the industry, they do reveal a trend that many people feel alarming in that the carcass traits of loin eye area and percent ham seem to be declining in all breeds.

Trends in Oklahoma Swine Carcass Contests

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Story in Brief

Data from 677 market hogs—183 Durocs, 275 Hampshires and 219 Crossbreds—entered by producers in the State Fair of Oklahoma “Golden Pork Chop Contest” (a swine carcass contest) from 1968 to 1979 were analyzed to determine the average change in carcass traits over time. Average increase in carcass length per year for all breeds was .184 in. ($P < .01$). Average decrease in backfat thickness for all breeds was .011 in. per year ($P < .01$). No significant change over time was noted for loin eye area or percent ham.

Data from 281 market hogs—44 Durocs, 72 Hampshires and 165 Crossbreds—entered by producers in the Oklahoma National Barrow Show Performance Contest from 1975 to 1978 were also analyzed to determine the average change in carcass traits over time. Average increase in carcass length per year for all breeds was .383 in. ($P < .01$). Average decrease in loin eye area per year for all breeds was .423 sq. in. ($P < .05$). No significant changes were noted in backfat thickness, percent ham or average daily gain; however, the trend for all breeds was a decrease in backfat thickness and an increase in percent ham and average daily gain.

Introduction

There has been considerable concern recently that less emphasis is being placed on carcass merit by swine breeders. It appears that some carcass traits such as loin eye area may be actually becoming inferior as reported by the popular press. Thus, data were analyzed on the pigs slaughtered in the Golden Pork Chop Contest, an Oklahoma State Fair Swine Carcass Contest, from 1968 to 1979 and the Oklahoma National Barrow Show Performance Contest from 1975 to 1978 to determine if changes had occurred over time in various carcass traits.

Materials and Methods

The Golden Pork Chop Contest and the Oklahoma National Barrow Show Performance Contest are open to any pork producer in the world; however, the vast majority of entries have been from Oklahoma. In the Golden Pork Chop Contest, the animal's are slaughtered at Cornett Packing Company, Oklahoma City, and processed at Schwab's Meats, Oklahoma City, while in the Oklahoma National Barrow Show Performance Contest, the animals are slaughtered and processed at Wilson Foods, Oklahoma City.

Slaughter weights, carcass length, backfat thickness, loin eye area, percent ham and ham-loin index were obtained in both contests. The adjusted slaughter weight was determined by using carcass weights and a standard dressing percentage of 71.7, 72.0, 72.4 and 72.7 percent for carcasses weighing 143 lb and below, 144-168, 169-175, 176 and up, respectively. Carcass length, backfat thickness and loin eye area were adjusted to 220 lb equivalent each year using adjustments recommended by the National Association of Swine Records. Premium winners in both contests were required to have acceptable pork quality and to meet certification standards adopted by the National Association of Swine Records.

Golden Pork Chop Contest

All animals entered in the Golden Pork Chop Contest were supposed to be farrowed after March 1 of each year and were exhibited and slaughtered in September of the same year. Only barrows were exhibited from 1968 to 1977 with both barrows and gilts being exhibited in 1978 and 1979. Winners in the contest were determined by the ham-loin index. No attempt was made to verify average daily gain or to consider any growth data in the contest.

The average adjusted slaughter weights were 208.2, 214.3, 213.8, 224.3, 222.6, 217.8, 232.3, 231.5, 237.4, 241.7, 236.9 and 226.4 lb for each year from 1968 through 1979, respectively. Increase in maximum weight allowed in the contest from 240 to 250 lb accounts for the large increase in slaughter weight in 1974.

Oklahoma National Barrow Show Performance Contest

All animals entered in the Oklahoma National Barrow Show Performance Contest were farrowed after February 1 and weighed in and identified with an ear tattoo at one of approximately 14 weigh stations in Oklahoma in early April. The animals were then exhibited, weighed and slaughtered in Oklahoma City in August. Both barrows and gilts were accepted in the contest.

Winners were determined by considering carcass merit, average daily gain and soundness using the following formula: $\text{Daily Gain} \times 75 + \text{Ham-Loin Index} + \text{Soundness Score}$. Soundness scores were determined by a committee of three people using a range of scores from 1 to 20 with 20 being ideal.

Table 1. Number of pigs of each breed for each year at the Golden Pork Chop Contest

Breed	Year of show												Total
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	
Berkshire	0	0	0	0	0	0	0	0	0	0	1	0	1
Chester													
White	4	2	3	1	9	3	3	8	2	1	5	0	41
Duroc	11	16	12	23	19	19	19	18	12	6	17	11	183
Hampshire	34	42	30	52	14	13	22	14	19	20	9	6	275
Poland	6	6	6	6	4	3	6	2	2	1	0	1	43
Spot	0	0	0	0	1	0	4	0	2	1	3	6	17
Yorkshire	3	2	4	0	0	0	0	4	1	0	4	2	20
Crossbred	17	13	20	17	24	20	33	18	24	9	9	15	219
Total	75	81	75	99	71	58	87	64	62	38	48	41	799

Table 2. Average adjusted carcass length for each year at the Golden Pork Chop Contest (in.)

Breed	Year of show												Overall avg.
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	
Duroc	30.25	30.56	30.01	30.66	30.22	31.33	31.35	31.30	31.33	31.96	32.46	32.38	31.15
Hampshire	30.31	30.76	30.40	30.82	30.50	31.31	31.42	31.52	31.77	31.46	32.06	32.63	31.25
Crossbred	31.01	30.92	30.70	30.84	30.79	31.25	31.10	31.51	31.35	32.16	32.26	32.61	31.37
Overall avg.	30.52	30.74	30.37	30.77	30.51	31.30	31.29	31.45	31.48	31.86	32.26	32.54	

Table 3. Average adjusted backfat thickness for each year at the Golden Pork Chop Contest (in.)

Breed	Year of show												Overall avg.
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	
Duroc	1.21	1.25	1.23	1.15	1.19	1.17	1.13	1.11	1.13	1.22	1.03	1.10	1.16
Hampshire	1.12	1.12	1.14	1.14	1.07	1.06	1.04	0.97	1.08	1.11	0.98	1.04	1.07
Crossbred	1.16	1.18	1.18	1.13	1.10	1.12	1.07	1.13	1.13	1.07	1.18	0.99	1.12
Overall avg.	1.16	1.18	1.18	1.14	1.12	1.12	1.08	1.07	1.11	1.13	1.06	1.04	

The average starting weights were 32.6, 48.4, 41.9 and 45.1 lb for the years 1975 through 1978, respectively. The average adjusted slaughter weights were 233.3, 241.3, 241.8 and 262.9 lb for the years 1975 through 1978, respectively.

Results and Discussion

Golden Pork Chop Contest

The number of pigs of each breed slaughtered each year from 1968 to 1979 in the Golden Pork Chop Contest is shown in Table 1. Statistical analysis was conducted only on the Duroc, Hampshire, and Crossbred pigs because the number of pigs representing the other breeds was small. These three breeds represented 677 of the 799 total number of animals slaughtered.

The average adjusted length of each year for Duroc, Hampshire, and Crossbreds is shown in Table 2. There has been a general increase in carcass length over time, probably reflecting the increased emphasis of purebred breeders, live show judges and others to produce longer hogs.

Average adjusted backfat thickness for each year is shown in Table 3. There has been a general decrease in backfat thickness over time, reflecting the emphasis of leaders in the industry on increasing percent lean and decreasing percent fat in market hogs.

Average adjusted loin eye areas and average percent ham are shown in Tables 4 and 5, respectively. Data for loin eye area are presented only from the years 1973 to 1979 as loin eye area values were not obtained in all pigs slaughtered previous to 1973. Definite trends are not apparent for either loin eye area or percent ham.

To better estimate the phenotypic time trends that have occurred since 1972, the breed means for each year were regressed to estimate the average change in performance per year for each trait measured. The regression coefficients are presented in Table 6. Average increase in carcass length per year for those breeds analyzed was .184 in. ($P < .01$) with each individual breed showing significant increases.

Average decrease in backfat thickness per year for the three breeds analyzed was .011 in. ($P < .01$) with each individual breed showing significant decreases. Little change over time was noted for loin eye area or percent ham. However, all breeds analyzed tended to increase in percent ham, and only the crossbreds failed to increase in loin eye area.

National Barrow Show Performance Contest

The number of pigs of each breed evaluated each year from 1975 to 1978 in the Oklahoma National Barrow Show Performance Contest is shown in Table 7. Statistical analysis was conducted on the Duroc, Hampshire and Crossbred pigs, which represented 281 head of the 322 total evaluated.

The average daily gain of pigs for each year is shown in Table 8. No apparent trend in average daily gain is evident. Values for average adjusted backfat thickness and adjusted carcass length are shown in Table 9. Backfat thickness tended to decrease and length to increase over time. This probably reflects a trend of purebred swine breeders, live show judges and others who are selecting longer and leaner pigs.

Values for percent ham and adjusted loin eye area for each year are shown in Table 10. A definite trend of a decrease in size of loin eye areas is evident. The percent ham appears to be declining since 1976.

Average changes in performance per year are shown in Table 11. Average decrease in loin eye area per year was .423 square inches ($P < .05$), with all three breeds following the same trend. Average increase in carcass length per year was .383 in. ($P < .01$), with all three breeds following the same trend. No significant changes were

Table 4. Average adjusted loin eye area for each year at the Golden Pork Chop Contest (sq. in.)

	Year of show							Overall
	1973	1974	1975	1976	1977	1978	1979	avg.
Duroc	5.14	6.23	5.93	5.62	5.52	5.81	5.78	5.72
Hampshire	5.58	6.50	6.41	6.14	6.26	6.02	6.07	6.14
Crossbred	5.34	6.28	6.12	6.21	5.42	5.61	5.94	5.85
Overall avg.	5.35	6.34	6.15	5.99	5.73	5.81	5.93	

Table 5. Average percent ham for each year at the Golden Pork Chop Contest

Breed	Year of show											Overall	
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	avg.
Duroc	16.02	16.66	17.84	16.34	17.53	17.53	17.63	17.19	16.92	17.03	16.12	16.86	16.97
Hampshire	16.21	16.63	17.47	16.71	17.17	17.83	17.22	17.08	16.48	17.22	16.25	17.48	16.98
Crossbred	16.03	16.46	17.27	17.01	17.22	17.48	17.47	16.62	16.66	17.15	16.22	17.62	16.94
Overall avg.	16.09	16.59	17.53	16.69	17.31	17.61	17.44	16.97	16.69	17.14	16.20	17.32	

noted in average daily gain, percent ham or backfat thickness. However, all three breeds tended to increase in average daily gain, increase in percent ham and decrease in backfat thickness.

General

Pigs in both contests tended to increase over time in carcass length and decrease in backfat thickness probably reflecting an industry trend towards producing longer and leaner market hogs. Although nonsignificant, pigs in both contests tended to increase over time in percent ham. Pigs in the Oklahoma National Barrow Show had a significant decrease over time in loin eye area while little change was noted for pigs in the Golden Pork Chop Contest. However, a slight decrease in loin eye area occurred from 1975 to 1978 for the Golden Pork Chop Contest, which covers the same years analyzed for the Oklahoma National Barrow Show Performance Contest.

Table 6. Average change in trait per year for the Golden Pork Chop Contest

Breed	Lgth	BF	LEA	% Ham
	in.	in.	sq. in.	%
Duroc	.213**	-.013**	.024	.002
Hampshire	.184**	-.010*	.014	.023
Crossbred	.155**	-.009*	-.009	.038
Overall avg.	.184**	-.011**	.010	.021

* Avg change per test is significantly different from zero, $P < .05$.

** Avg change per test is significantly different from zero, $P < .01$.

Table 7. Number of pigs for each year at the Oklahoma National Barrow Show Performance Contest

Breed	Year of show				Total
	1975	1976	1977	1978	
Berkshire	0	2	0	0	2
Chester White	2	5	1	2	10
Duroc	10	15	12	7	44
Hampshire	18	25	15	14	72
Poland	0	0	0	1	1
Spot	1	6	7	5	19
Yorkshire	0	0	9	0	9
Crossbred	17	46	55	47	165
Total	48	99	99	76	322

Table 8. Average daily gain for each year at the Oklahoma National Barrow Show Performance Contest^{ab}

Breed	Year of show				Overall avg.
	1975	1976	1977	1978	
Duroc	1.59	1.51	1.58	1.58	1.57
Hampshire	1.56	1.46	1.56	1.66	1.56
Crossbred	1.57	1.57	1.61	1.64	1.60
Overall avg.	1.58	1.51	1.58	1.63	

^aAvg starting weights were 32.6, 48.4, 41.9 and 45.1 lb for 1975 through 1978, respectively.

^bAvg final weights were 233.3, 241.3, 241.8 and 262.9 lb for 1975 through 1978, respectively.

Table 9. Average adjusted backfat thickness and carcass length for each year at the Oklahoma National Barrow Show Performance Contest

Breed	Year of show									
	1975		1976		1977		1978		Overall avg.	
	BF ^a	Lgth ^b	BF ^a	Lgth ^b	BF ^a	Lgth ^b	BF ^a	Lgth ^b	BF ^a	Lgth ^b
Duroc	1.19	31.06	1.24	30.69	1.13	31.62	1.08	32.28	1.16	31.41
Hampshire	1.11	31.19	1.17	31.65	1.06	31.57	1.00	32.14	1.09	31.64
Crossbred	1.23	30.91	1.15	31.67	1.12	31.65	1.11	32.29	1.15	31.63
Overall avg.	1.18	31.06	1.19	31.34	1.10	31.61	1.06	32.24		

^aBF = Carcass backfat thickness expressed in inches.^bLgth - Carcass length expressed in inches.**Table 10. Average % ham and adjusted loin eye area for each year at the Oklahoma National Barrow Show Performance Contest**

Breed	Year of show									
	1975		1976		1977		1978		Overall avg	
	% Ham	LEA ^a	% Ham	LEA ^a	% Ham	LEA ^a	% Ham	LEA ^a	% Ham	LEA ^a
Duroc	16.48	5.69	18.13	5.13	17.52	4.61	17.17	4.41	17.33	4.96
Hampshire	16.32	6.13	18.42	5.42	17.84	4.87	16.93	4.93	17.38	5.34
Crossbred	16.28	6.22	18.37	5.48	17.23	4.71	17.04	5.07	17.23	5.37
Overall avg	16.36	6.01	18.31	5.34	17.53	4.73	17.05	4.81		

^aLEA = Loin eye area expressed in square inches.

Table 11. Average change in trait per year for the Oklahoma National Barrow Show Performance Contest

Breed	ADG	% Ham	LEA	BF	Lgth
	lb	%	sq. in.	in.	in.
Duroc	.004	.146	-.436*	-.043	.460
Hampshire	.038	.127	-.413	-.045	.276
Crossbred	.026	.115	-.420	-.039	.412
Overall avg	.023	.130	-.423*	-.042	.383**

* Avg change per test is significantly different from zero, $P < .05$.

** Avg change per test is significantly different from zero, $P < .01$.

Preliminary Development of Yield Grade and Dressing Percentage Prediction Equations for Beef Steers

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Story in Brief

Equations to predict yield grade and dressing percentage from average daily gain, days on feed and final weight information for beef steers were developed. The equations could serve as a tool to help determine when to slaughter a pen of cattle to achieve the desired yield grade and/or dressing percentage. When tested against a small amount of data, the yield grade equation did a reasonable job in predicting yield grade. On the average, the predicted yield grade was within .13 of the actual yield grade values. However, both equations need further testing and examination to assess their accuracy.

Introduction

There has been an increased demand for leaner beef. The amount of lean beef from an animal may be indicated by the animal's yield grade and/or dressing percentage. Thus, identification of variables in beef production that influence yield grade and dressing percentage would be useful in producing leaner beef with higher cutability. The animals and time involved in conducting experiments to obtain data so that prediction equations for yield grade and dressing percentage can be developed are costly. Another approach is to assimilate data which have already been reported to establish mathematical relationships among variables influencing yield grade and dressing percentage. The purpose of this report is to present equations for predicting yield grade and dressing percentage.

Materials and Methods

The approach in this study was to use data reported by the U.S. Meat Animal Research Center (MARC)¹ to develop prediction equations for yield grade and dressing percentage. The dressing percentage reported in the MARC data was equal to hot

¹Cattle Germ Plasm Evaluation Program Progress Reports 1-5, 1974-1977, U.S. Meat Animal Research Center, U.S.D.A., Clay Center, Nebraska.