

DIFFERENCES IN LENGTHS OF GESTATION PERIODS OF BREEDS OF BEEF CATTLE, SWINE, AND SHEEP¹Leslie E. Johnson²

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Investigators have made many studies of the length of gestation periods of farm meat animals. The chief objective of these studies has been to determine the average length of gestation for each species. There are few critical data on the length and variation of gestation periods of the various breeds comprising species.

Knapp et al³ reported 280.8 days as the gestation period beef Shorthorns. Rife et al⁴ found purebred Hereford cows carried their calves 289 days and purebred Aberdeen-Angus cows carried their calves 272.8 days. Wellman⁵ has given 284.61 days for Hungarian cattle and 291.2 days for Simmental cattle.

Carmichael and Rice⁶ found the following gestation periods for breeds of swine in the University of Illinois herd; Berkshires, 115.4 days; Poland China, 114.6 days; Tamworth, 113.8 days; Larke Yorkshire, 113.2 days; Duroc Jersey 113.1 days; and Chester White, 113.0 days. Johansson⁷ reported 114.3 days as the average gestation period of Large White swine.

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²Data taken from records kept by T. R. H. Wright, J. W. Wilson, F. U. Fenn, and W. H. Burkitt.

³Knapp, Jr., Bradford, Lambert, W. V., and Black, W. H. Factors influencing length of gestation and birth weight in cattle. *Jour. Agr. Res. (U.S.)* 61: 277-285. 1940.

⁴Rife, David C., Gerlaugh, Paul, Kunkle, Lawrence, Brant, Graydon W., and Snyder, Lawrence H. Comparative lengths of the gestation periods of Aberdeen-Angus and Hereford cows carrying prebred and crossbred calves. *Jour. Ani. Sci.* 2:50-52. 1943.

⁵Wellman, O. On the deviation of length of the gestation period according to the season of the year. (Trans. title. Original article not examined.) *Landw. Jahrb. (Berlin)* 39:409-428. 1910.

⁶Carmichael, W. J. and Rice, John B. Variations in farrow: with special reference to birth weight of pigs. *Ill. Agr. Expt. Sta. Bul.* 226:67-95. 1920.

⁷Johansson, I. Length of gestation period in cattle and swine. (Trans. title. Original article not examined). *Red. Ultura Landbt. Inst. (Sweden)* 41,59. 1928.

Daley and Eastoe^a have given 144.05 days as the average gestation period of Dorset Horn ewes.

Data Studied

The data used in this study were obtained from the Animal Husbandry herds and flocks of South Dakota State College. The records on cattle were collected during the period 1929-44; swine 1926-43; and sheep, 1940-44.

Only gestation periods of purebred dams carrying purebred offspring were included. Also no gestations were included where all the young were born dead. Three breeds of cattle, five breeds of swine, and four breeds of sheep were included in the comparisons.

Findings

Table 1 gives the average length of gestation period and standard deviation of individual periods for each breed studied. No two breeds within a species had identical gestation periods but several were very similar. The difference between all possible comparisons within each species are given in Table 2.

Of the cattle breeds the Shorthorns and Herefords had practically identical gestation periods, 283.5 days and 283.4 days. Aberdeen-Angus cows, however, carried their calves only 280.9 days. The 2.6 days difference between Shorthorns and Aberdeen-Angus was statistically significant and the 2.5 days difference between Hereford and Aberdeen-Angus was highly significant. Apparently Aberdeen-Angus cows carry their calves fewer days than Shorthorns or Herefords. The standard deviation of individual gestations was approximately 5 days for each of the breeds studied.

The swine breeds showed variations in length of gestations similar to those of the cattle breeds. The Poland Chinas had the longest period, 116.0 days. The gestation periods of the other four breeds were: (1) Spotted Poland

^aDaley, C. J. and Eastoe, R. Breeding habits of the Dorset Horn. The gestation period and the occurrence of multiple births. *Agr. Gaz. N. S. Wales.* 54:75-78. 1943.

China, 115.8 days; (2) Duroc Jersey, 114.8 days; (3) Chester White, 113.9 days; and (4) Hampshire, 113.4 days. Poland China sows and Spotted Poland China sows had very similar gestation periods. This was also true of the Chester White and Hampshire breeds. The differences between all other possible comparisons, however, was statistically significant. The standard deviation of individual gestation periods for each breed of swine was approximately two days.

Among the four sheep breeds only the Rambouillets were distinctly different from all others in length of gestation. Rambouillet ewes carried their young 3.7 days longer than Shropshires, 4.7 days longer than Southdowns, and 5.3 days longer than Hampshires. All of these differences were highly significant. The gestation periods of the three mutton breeds were all somewhat shorter than figures usually given for sheep. This is probably because many of the early gestation studies were made on Rambouillets. The difference between Shropshires and Hampshires was 1.6 days. This difference, although not large, was significant. The standard deviation of individual gestations was approximately 4 days for each breed studied.

Discussion

This study indicates that real differences exist in length of gestation periods between breeds within species. The size of the differences between most breeds, however, appears to be small. In none of the comparisons of this study did the differences approach that found between Hereford and Aberdeen-Angus cows by Rife et al. Their study showed that Hereford cows carried purebred calves 16.2 days longer than Aberdeen-Angus cows carried purebred calves. The small number of data included in their study and the abnormal distribution of these data, however, suggest that their samples may not have been representative of the breeds.

That differences exist between breeds and that such differences are small appears reasonable. During the last fifty or more years the system of purebred breeding used in this

country has isolated the breeds and increased the homozygosity of each approximately one-half of 1 percent per generation. Thus present breeds have been isolated long enough and inbred sufficiently for small differences to have developed in length of gestations. If many highly inbred lines of livestock are bred in the future much larger differences than exist now may occur between breeds and between inbred lines within breeds.

To know the amount of variation in individual gestation periods within breeds is highly important in establishing proper management practices for pregnant females. In normally distributed data, the mean plus and minus one standard deviation includes two-thirds of the data. The mean plus and minus two standard deviation includes approximately 95 percent of the items. Thus the gestation period will be between 273.1 and 293.9 days for practically all Shorthorn cows; between 112.7 and 119.3 days for most Poland China sows; and between 144.7 and 154.9 days for Rambouillet ewes. The range in length of gestation periods of other breeds can be similarly estimated from the means and standard deviations given in this paper.

Summary

Small but real differences exist between the lengths of gestation periods of many breeds of livestock. The variation within breed of each species appear to be somewhat similar. Proper management practices for pregnant females should be based on the mean and variation of individual gestation periods of each specific breed or highly inbred line of livestock.

Table 1. Length of Gestation Periods of Breeds of Beef Cattle, Swine, and Sheep

Kind and breed of animals	Number of gestations included in average	Average length of gestation period	Standard deviation of individual gestation period	Coefficient of variation (percent)
Cattle:				
Shorthorn	34	283.5	5.20	1.83
Hereford	98	283.4	4.63	1.63
Aberdeen-Angus	112	280.9	5.99	2.13
Swine:				
Poland China	414	116.0	1.67	1.44
Spotted Poland China	57	115.8	1.89	1.63
Duroc Jersey	422	114.8	2.02	1.76
Chester White	133	113.9	1.93	1.69
Hampshire	53	113.4	2.45	2.16
Sheep:				
Rambouillet	17	149.8	2.56	1.71
Shropshire	54	146.1	3.87	2.65
Southdown	21	145.1	3.85	2.65
Hampshire	86	144.5	4.25	2.94

Table 2. Differences in Length of Gestation Periods of Breeds of Beef Cattle, Swine, and Sheep

Breeds Compared	D/t	Difference in days	Standard error of Difference	t value 1
Cattle:				
Shorthorn vs Hereford.....	130	.1	1.007	.10
Shorthorn vs Aberdeen-Angus..	144	2.6	1.056	2.46*
Hereford vs Aberdeen-Angus...	208	2.5	.734	3.41**
Swine:				
P. China vs Spotted P. China...	469	.2	.263	.76
Poland China vs Duroc Jersey...	834	1.2	.128	9.37**
Poland China vs Chester White...	545	2.1	.186	11.29**
Poland China vs Hampshire....	465	2.6	.346	7.51**
Spotted P. China vs D. Jersey...	477	1.0	.269	3.72**
Spotted P. China vs Chester W. ...	188	1.9	.301	6.31**
Spotted P. China vs Hampshire...	108	2.4	.420	5.71**
Duroc Jersey vs Chester White...	553	.9	.194	4.64**
Duroc Jersey vs Hampshire....	473	1.4	.351	3.99**
Chester White vs Hampshire...	184	.5	.376	1.33
Sheep:				
Rambouillet vs Shropshire....	69	3.7	.814	4.55**
Rambouillet vs Southdown....	36	4.7	1.045	4.50**
Rambouillet vs Hampshire....	101	5.3	.772	6.87**
Shropshire vs Southdown....	73	1.0	.992	1.01
Shropshire vs Hampshire....	138	1.6	.698	2.29*
Southdown vs Hampshire....	105	.6	.957	.63

1. In this paper a single asterisk (*) or the word "significant" has been used to indicate that the value would occur by chance in not more than 5 or less than 1 percent of the trials. A double asterisk (**) or "highly significant" indicates a value that would occur by chance in less than 1 percent of the trials.