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A study of the length of the gestation period of the Jersey and Holstein-Friesian herds of the University of Arkansas was made. This study covered the years 1934 to 1952 for the Jersey herd and 1937 to 1952 for the Holstein-Friesian herd. Only those gestations which terminated in single births of normal calves were considered. A total of 570 gestation periods averaged 278.6 days each, with 269 male calves being carried an average of 279.5 days and 301 female calves an average of 277.7 days. There were 288 gestation periods in the Holstein-Friesian herd averaging 277.8 days in length; 142 males averaged 278.9 days and 146 females averaged 276.8 days. In the Jersey herd a total of 282 calvings averaged 279.3 days in length, with 127 males being carried an average of 280.2 days and 155 females carried an average of 278.6 days.

An analysis of variance of unweighted means (Table 1) for the Holstein-Friesian herd, omitting all sires with less than six offspring, was computed.

TABLE 1. Analysis of Variance of Unweighted Means: Holstein-Friesian

Source	df	SS	MS	F	F.05	F.01
Total	284	9,501				
Season	1	105	105.0	3.87	3.88	6.73
Sires	10	1,975	197.5	7.29	1.86	2.39
Sex	1	305	305.0	11.20		
Sires X Season	10	179	17.9			
Sires X Sex	10	398	39.8			
Sex X Season	1	0				
Sex X Season X Sires	10	0				
Error	241	6,539	27.1			

The seasons as used here are two, one including the cool and/or cold months, October through March, and the other including the warm and/or hot months, April through September. The difference in length of gestation due to season approached significance. The differences due to sires and sex were highly significant (F.01).

The analysis of variance of unweighted means (Table 2) for the Jersey herd was calculated on the same basis as to selection of sires and the use of the term "season" as for the Holstein-Friesian herd.

TABLE 2. Analysis of Variance of Unweighted Means: Jersey

Source	df	SS	MS	F	F.05	F.01
Total	244	5,835				
Season	1	100	100.0	4.69	3.88	6.75
Sires	12	459	38.3	1.80	1.80	2.27
Sex	1	134	134.0	6.29		
Sires X Season	12	70	5.8			
Sires X Sex	12	485	40.4	1.90		
Sex X Season	1	55	55.0	2.58		
Sex X Season X Sires	12	423	35.3	1.66		
Error	193	4,109	21.3			

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The differences due to season, to sires, to sex, and to sires X sex interaction was significant (F.05), based on the error term.

The correlation between age at calving and length of gestation for the Jersey herd was + 0.127, which was significant (P.05). For the Holstein-Friesian herd correlation was + 0.122, which also was significant (P.05). After taking out difference due to breed, the herd as a whole had a correlation coefficient between age at calving and length of gestation of + 0.124, which was highly significant (P.01).

A regression value was determined for age at calving and length of gestation for the combined Jersey, Holstein-Friesian herds. This value was + 0.024, indicating that for every month increase in age, the length of gestation period increased 0.024 day.

Due to the inaccuracies caused by unequal subclass members, further statistical manipulation of the data should be made according to the procedure of weighted means as given by Snedecor (1).

References

1. Snedecor, G. W. *Statistical Methods.* 4th edition, The Iowa State College Press, Ames, Iowa. 1946.