

# EVALUATION OF FACTORS AFFECTING BIRTH WEIGHT IN FRIESIAN CATTLE

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## SUMMARY

Birth weights of 985 pure Friesian calves produced by 304 imported cows and their locally born daughters during 1978-1982 at the April 7th State Farm, were analysed by the least squares method. Birth weight averaged 34.3 kg; males excelled females by 2.4 kg ( $p < .01$ ). Parity, gestation period, dam's country of origin, and month, season and year of calving each affected calf birth weight ( $p < .01$ ). Birth weight increased steadily with advancing age of dam and with increasing length of gestation. Spring and summer born calves were heavier at birth than autumn and winter born calves. Locally born ~~cows~~ produced smaller calves than imported cows. The repeatability of birth weight was .151.

## INTRODUCTION

A positive relationship between birth weights and subsequent weights of calves has been reported in the literature (Juma and Kassir, 1967). Calves with birth weights slightly above their herd average, besides having better chance for survival, tend to be more vigorous and gain faster than calves born lighter.

The object of this work was to investigate some of the factors influencing birth weight of pure Friesian calves produced by imported cows and their locally born daughters. Such a study is useful when formulating breed improvement programmes taking into consideration that breeding cattle are often selected at an early age and that there has been an increased interest in the production of beef from dairy cattle.

## RESULTS

### Factors affecting birth weight

Tables 1 and 2 reveal the various effects on birth weights of calves.

Birth weight averaged 34.34 kg, being 2.02 kg higher than a previous estimate for the Friesian in Iraq (Juma and Kassir, 1967). Males were 2.4 kg heavier at birth than females ( $p < .01$ ). Parity and gestation period, month, season and year of calving, and country of origin of dam each affected birth weight significantly ( $p < .01$ ). Birth weight increased steadily with advancing age of dam till the 5th parturition, as well as with increasing length of gestation till 281-285 days. Spring and summer born calves excelled autumn and winter born calves in their birth weights. Locally born cows produced smaller calves at birth than imported cows.

The repeatability of birth weight, estimated by the intra-class correlation method (based on the first three consecutive records) was very low, being .151, using 633 pairs.

#### GENERAL DISCUSSION AND CONCLUSIONS

When birth weights of calves produced by imported cows and their locally born daughters are compared, the reduction observed in the birth weight among the daughters is probably due to physiological effects resulting from the different environmental conditions under which dams and daughters were reared. Hence, summers in central Iraq are very severe and long with mean temperature of 43C. The repeatability estimate obtained indicates that the heritability of birth weight is very low. This low heritability reflects the major environmental influence and the low genetic variation. Consequently raising the standards of feeding, management and hygiene will result in the improvement of birth weight.

#### REFERENCES

JUMA, K. H. AND KASSIR, S. 1967. Some factors influencing birth weights of purebred and crossbred Friesian calves. Indian J. Dairy Sci. 20 19-24

TABLE 1. Least squares estimates of effects on birth weight of Friesian calves (1st mathematical model)

Classification	No.	Estimate + S.E.	D.T.*
Overall mean	985	34.340 + 0.287	
Sex			
Males	512	1.203 + 0.324	a
Females	473	- 1.203 + 0.333	b
Parity			
1	257	- 3.110 + 0.355	b
2	190	- 1.236 + 0.410	bc
3	275	0.771 + 0.352	ac
4	237	1.349 + 0.383	a
5	26	2.226 + 1.005	a
Gestation period (days)			
271	259	- 4.631 + 0.369	b
271 - 275	370	- 0.081 + 0.323	c
276 - 280	223	1.469 + 0.378	ac
281 - 285	91	2.166 + 0.554	a
286 - 290	42	1.077 + 0.798	ac
Calving season			
Spring (March-May)	191	1.485 + 0.475	a
Summer (June-Aug.)	264	1.237 + 0.405	a
Autumn (Sept.-Nov.)	370	- 1.942 + 0.337	b
Winter (Dec.-Feb.)	160	- 0.780 + 0.459	b

\* D.T.= Duncan's Multiple Range Test

Within each classification estimates followed by the same letter are not significantly different from each other, otherwise they differ significantly ( $p < .01$ ).

TABLE 2. Least squares estimates for factors affecting birth weights (2nd mathematical model)

Classification	No.	Estimate + S.E.		D.T.*
Overall mean	985	32.028	+ 0.334	
Month of calving				
1	50	- 2.001	+ 0.865	de
2	47	- 0.922	+ 0.876	bode
3	68	0.767	+ 0.766	bc
4	71	1.512	+ 0.760	ac
5	52	0.988	+ 0.856	ac
6	54	0.287	+ 0.804	bce
7	66	3.215	+ 0.737	a
8	144	0.691	+ 0.526	bce
9	148	- 1.608	+ 0.541	bde
10	106	- 2.100	+ 0.651	d
11	116	- 0.177	+ 0.635	bce
12	63	- 0.652	+ 0.803	bode
Calving year				
1978	192	2.209	+ 0.571	a
1979	229	1.586	+ 0.513	a
1980	261	0.300	+ 0.439	b
1981	228	- 0.892	+ 0.473	b
1982	75	- 3.203	+ 0.710	c
Dam's country of origin				
Holland	889	1.665	+ 0.220	a
Iraq	96	- 1.665	+ 0.619	b

\* D.T. = Duncan's Multiple Range Test

Within each classification estimates followed by the same letter are not significantly different from each other, otherwise they differ significantly ( $p < .01$ ).