

**A GENETIC ANALYSIS OF THE FRIESIAN CATTLE IN  
HOLLAND WITH REFERENCE TO THE EFFECT  
OF INBREEDING ON SOME ECONOMIC CHARACTERS**

*By*

M.T. RAGAB (1) AND A.B. ABDELNOOR (2)

**SUMMARY**

Pedigrees of 2160 animals chosen at random from the Friesian Herd Book Society (N.R.S.) were utilized in this investigation. The work covered a period of fifty years (from 1909 to 1959). The results obtained showed that the average coefficient of inbreeding was 1.7% and 0.6% for males and females respectively. The average coefficient of inbreeding for the high producing cows was 0.36%.

The average coefficient of relationship based on 1030 pairs of pedigrees chosen at random, came to 0.3% ranging from 0.0% to 1.4%. The average inbreeding relationship came to 0.1% ranging from 0.0% to 0.3%.

Eight sires from N.R.S. and also three sires from F.R.S. were the most important sires during the period of study. The average direct relation of the important sires, (Willem 2-1496), (Apis-5108), (Heridon-10148), (Emir-1145), (Constantijn, Frause-11881), Hasdrubal-12294) (Oldambtster Luctor-17338), and (Oldambtster Adema 1-19056) from N.R.S. and (Adema 197-22231), (Adema-25437) and Sire <sup>no.</sup>(17385) from F.R.S. were 1.17%, 1.05%, 2.05%, 2.10%, 1.47%, 1.20%, 1.98%, 3.22%, 0.84%, 1.40% and 0.51% respectively.

Sire <sup>no.</sup>(19056) was actually considered as the great great-great-grandfather of the Friesians in Holland.

Age at first calving was found to be increased when inbreeding coefficient increased. The correlation between the two aspects was 0.607 and the regression was one month of age at first calving for every 1% increase over the average inbreeding.

Milk yield was found to be significantly and negatively affected by inbreeding. The regression of milk yield on inbreeding was -0.68.34 Kilograms per lactation. Also it was found that inbreeding had no effect on fat percentage.

**INTRODUCTION**

Although the genetic structure of the Friesian cattle has been studied in England, U.S.A. and Canada, yet information on this breed in its homeland is still lacking. The Friesian cattle is now the main breed in many countries in the world as well as in the U.A.R.

(1) Chairman of the Board of Directors of the Meat and Milk Organization.

(2) Animal Production Department, Tahrer Province Organisation.

Since the breed exists now in this country in rather big numbers, and, more importation are still carried on, it was thought that studying the genetic structure of the Friesian breed of cattle in Holland being one of the main exporting countries, will help in knowing more information as regards to the local nucleus in the U.A.R.

Results obtained in this work may be utilized in choosing the best breeding methods that can be applied in breeding, and improving, the local Friesians in this country. Moreover, the genetic structure of the Friesian in Holland can be compared with other breeds.

Also the effect of inbreeding was studied as far as age at first calving, length of lactation, fat percentage and milk yield. The results obtained in this connection, will also help in establishing the best breeding scheme for imported cattle.

### MATERIAL AND METHODS

The data used in this work was collected at random from the Netherland's cattle Herdbook Association (N.R.S.), between 1909 and 1959, covering a period of 50 years.

The random sample was collected by taking the first and the last animal in the first page in each volume of the herdbook, then taking the first and the last animal on the eleventh page and so on.

A number of 2160 cows and bulls with their pedigrees up to the fifth generation were included in this report. The number of animals obtained in this year depended upon the total number of animals registered in this particular year. The bulls used were 85, while 2075 cows were included in this investigation.

200 males and an equal number of females were chosen at random during the period from 1940 to 1950 to study the difference between the two sexes in inbreeding.

The pedigrees of 200 high producing cows were examined and compared with the average cows as far as inbreeding coefficient is concerned.

The methods developed by Wright (1922) were used for estimating the coefficient of inbreeding, coefficient of relationship and inbreeding relationship.

Important animals in the breed were those drawing an average direct relationship to the breed more than those sires having more than 20 daughters or animals appearing in more than 3% of the pedigree of the records studied.

## RESULTS AND DISCUSSION

## I.—THE GENETIC STRUCTURE OF FRIESIAN IN HOLLAND :

*A.—Coefficient of Inbreeding*

Results obtained in Table (1) indicate that the average coefficient of inbreeding during the period of study using records of both sexes, was 0.88% ranging from 0.0% to 25%.

TABLE 1.—COEFFICIENTS OF INBREEDING, RELATIONSHIP AND INTERSE RELATIONSHIP FOR THE FRIESIAN CATTLE IN HOLLAND

Year	Fx %	Rela- tionship	Interse Relation- ship	Year	Fx %	Rela- tionship	Interse Relation- ship
1909. . .	—	—	—	1934-35. . .	1.500	1.300	0.210
1910. . .	—	—	—	1935-36. . .	0.800	1.200	0.239
1911. . .	—	—	—	1936-37. . .	0.700	0.350	0.087
1912. . .	—	—	—	1937-38. . .	0.150	0	0
1913. . .	—	—	—	1938-39. . .	0.800	0.991	0.205
1914-15. . .	—	—	—	1939-40. . .	1.130	0.260	0.059
1915-16. . .	3.125	0	0	1940-41. . .	0.540	0.149	0.022
1916-17. . .	0.900	0	0	1941-42. . .	0.781	0.120	0
1917-18. . .	0.240	0	0	1942-43. . .	1.150	0.990	0.045
1918-19. . .	1.200	0	0	1943-44. . .	0.900	1.440	0.293
1919-20. . .	0.001	0	0	1944-45. . .	0.630	0.729	0.126
1920-21. . .	1.200	0	0	1945-46. . .	0.952	0.326	0.031
1921-22. . .	0.210	0	0	1946-47. . .	0.740	0.467	0.079
1922-23. . .	0.450	0	0	1947-48. . .	0.700	0.260	0.039
1923-24. . .	0.300	0	0	1948-49. . .	0.185	0.038	0.005
1924-25. . .	0.940	0	0	1949-50. . .	0.860	0.071	0
1925-26. . .	0.001	0.160	0.020	1950-51. . .	0.500	0.163	0.021
1926-27. . .	3.030	0	0	1951-52. . .	0.440	0.008	0.002
1927-28. . .	2.410	0.100	0.008	1952-53. . .	0.600	0.018	0.018
1928-29. . .	1.850	0	0	1953-54. . .	0.600	0.039	0.024
1929-30. . .	2.240	0.300	0.023	1954-55. . .	0.500	0.039	0.043
1930-31. . .	1.200	0.030	0	1955-56. . .	0.530	0.031	0.026
1931-32. . .	0.900	1.340	0.334	1956-57. . .	0.200	0.441	0.093
1932-33. . .	1.200	1.100	0.141	1957-58. . .	0.600	0.651	0.084
1933-34. . .	1.640	0	0	1958-59. . .	0.500	0.305	0.056

The coefficient of inbreeding reached its maximum in the years 1915-16, 1926-27, 1927-28, and 1929-30, coming to 3.1%, 3.0%, 2.4%, and 2.2% respectively. The coefficient of inbreeding was zero in the years 1919-20 and 1925-26 as it is shown in Table (1).

From 1935-36 to 1958-59, the coefficients of inbreeding were very low, and estimates ranged between 0.18% and 1.15%, but it was below 1% in most years as it is shown during the period from 1943-44 to 1958-59.

The results of this study on the Friesians in Holland are very close to that obtained by Asker (1959), Robertson and Asker (1951) working on the Friesian's in England. Results obtained by Ragab and Asker (1957) are also in close agreement with the present investigation.

Estimates obtained in this work indicated that the coefficient of inbreeding of the Friesians in its home land was 0.88% but it was 0.20% to 0.38% in the British Friesian (Asker 1949), 0.60% in the Friesian imported to Tahreer Province in U.A.R. (Ragab and Asker 1957), and 0.20% to 0.57% in the Canadian Friesian (Hickman 1961). Our results are in complete agreement with that reported by (Ragab and Asker 1957) as far as the level of inbreeding in the Friesians of Holland, and the average coefficient of inbreeding for the breed are concerned.

The inbreeding coefficient of 26% found in the Shorthorn breed (Wright 1925), 8.1% found in the Hereford breed in 1930 (Willham 1927) and 8.3% found in the Ayrshire breed in Scotland (Fowler 1932) are higher than that found in the Friesian in Holland.

#### B.—*Inbreeding of males and females:*

The coefficient of inbreeding for 200 males and 200 females selected at random during the period from 1940 to 1950, were worked out (Table 2).

It can be seen that the coefficients of inbreeding in males are higher than those in females. The average coefficient of inbreeding for males ranged between 0.8% and 3.9%. In case of females the average coefficient of inbreeding ranged between 0.03% and 1.1%.

It was also found that, about 27.5% of males studied were inbred while only 10.5% of the cows were inbred. The coefficient of inbreeding for males, decreased gradually for the first years of the study to the last year without any particular trend. Test of significance however showed that the difference between inbreeding in males and in females was not statistically significant at 1% of level.

#### C.—*Inbreeding of high yielding cows:*

It was possible to obtain the pedigree of 200 high yielding cows during the period from 1940-41 to 1952-53, and also their first lactation milk yield.

The two hundred high producing cows were collected from the records of 867 cows and their percentage was 23% of the total cows, while their average first lactation was 4203 kilograms of milk.

TABLE 2.—INBREEDING IN MALES AND FEMALES IN THE FRIESIANS OF HOLLAND

Year	FX %	
	Males	Females
1940-41 . . . .	2.1	0.3
1941-42 . . . .	1.9	0.7
1942-43 . . . .	1.8	1.1
1943-44 . . . .	2.1	0.7
1944-45 . . . .	3.9	0.5
1945-46 . . . .	1.9	0.9
1946-47 . . . .	0.9	0.6
1947-48 . . . .	1.4	0.6
1948-49 . . . .	0.3	0.03
1949-50 . . . .	1.2	0.4

Their average coefficient of inbreeding was 0.36% which is lower than that of the average of the breed which came to 0.88% Table (4).

Only twelve cows out of the 200 high producing females were inbred, therefore, the percentage of the inbred cows to the total number of the high yielders came to 6%, but, their percentage to the total number of the cows studied reached only 1.4%.

Asker (1949) studying the British Friesians, found that the average coefficient of inbreeding of the high producing cows was 0.38%, but it was 0.29% in his studies on the Shorthorn breed in Britain which is in agreement with the present work.

Asdell (1945) found that the average coefficient of inbreeding using on hundred pedigrees of high producing cows came to 1.79% in the U.S.A.

TABLE 3.—AVERAGE DIRECT RELATIONSHIP AND DATE OF BIRTH FOR THE IMPORTANT SIRES.

Important Sires	Date of birth	Average direct relationship %
<i>N.R.S. :</i>		
Willem 2-(1496) . . . . .	6.11.1914	1.17
Apis (5108) . . . . .	20. 3.1920	1.05
Heridon (10148) . . . . .	2.12.1928	2.05
Emir (11445) . . . . .	30.10.1930	2.10
Constanijn Franse (11881) . . . . .	27. 2.1931	1.47
Hasdrubal (12294) . . . . .	26. 3.1932	1.20
Oldambtster Luctor (17338) . . . . .	7. 2.1938	1.93
Oldambtster Adema (19056) . . . . .	17. 3.1940	3.22
<i>F.R.S. :</i>		
Adema 197 (22231) . . . . .	—	0.84
Adema (25437) . . . . .	—	1.40
Sire no (17375) . . . . .	—	0.51

D.—*Coefficient of Relationship :*

The coefficient of relationship between the individuals studied are given in Table (1), which ranged from 0.0% to 1.4% with an average of 0.3%. The coefficient of relationship during the first period till the year 1924-25 and also in the years 1926-27, 1928-29, 1933-34 and 1937-38 were Zero, and did not exceed 1% in most of the years.

Ragab and Asker (1957) reported that the coefficient of relationship came to about 2% in an imported Friesian herd to the U.A.R.

*E.—Inter-se Relationship :*

The inter-se relationships during the period from 1909 to 1953-59 were very low, (Table 1) and the average was found to be 0.1% ranging from 0.0% to 0.3% (Table 1). During the earlier period till 1924-23, and also in the years 1926-27, 1928-29, 1930-31, 1933-34, 1937-38, 1941-42 and 1949-50, the inter-se relationship was zero.

Willham (1927) concluded that the inter-se relationship in the Hereford breed in U.S.A. was 8.8% in 1930. Ragab and Asker (1957) found that the inter-se relationship was 1.9% in their studies on the Friesian heifers imported from Holland to Tahreer Province in U.A.R. during the years 1953-54.

*F.—Important Sires :*

Eleven sires, eight of them from N.R.S., and the three from F.R.S. were the most important sires during the fifty years studied, (Table 3). The eight important sires of N.R.S. were (Willem 2-1946), (Apis-5108), (Heridon-10148), (Emir 11445), (Constantijn France 11881), (Hasdrubal-12294), (Oldambtster Luctor-17338) and (Oldambtster Adema 19056). The three important sires of F.R.S. were (Adema 197-22231), his son (Adema-25437) and Sire no (17375).

Six of the eight important sires of N.R.S. were relatives, and some of them were closely related to each others.

Some investigators studied sires in different breeds of cattle. Wright (1923) found that sire (Favourite) was one of the important bulls in the shorthorn breed in Britain.

William (1927) found that the important sire (Beau Brummel-51817), a grandson of (Anxiety 4th) had the highest relationship to the Hereford breed in the U.S.A.

Its relationship to the breed came to 24.6% in 1930. Stonaker (1943) found that Sire (Black Prince of Tillyfour) was the important Aberdeen-Angus bull in U.S.A. and its average relationship to this breed in 1939 was 24%. Asker (1949) in Britain found that sire (Terling-21533) influenced the British Friesians more than any other bull.

Our results agreed with those obtained by (Ragab and Asker 1957). They found that there were four important Friesian bulls in the herd imported in 1935-54 to the Tahreer Province from Holland. These four important bulls were (Adema 197-22231), (Adema 25437), (Anna's Adema-26560), and (Jan-29845) and their average direct relationship to the herd were 6.03%, 3.18%, 0.42% and 2.64% respectively.

## II.—EFFECT OF INBREEDING ON ECONOMIC CHARACTER

The average milk yield for 2075 cows came to 4203 kilograms while average fat percentage was 3.86%. The average age at first calving reached 30 months and the average length of lactation period was 328 days.

Tables (4) and (5) show the average coefficient of inbreeding, milk yield, fat percentage, at first calving, and length of lactation period of animals selected at random from the herd books and utilized in this work.

## A.—Effect of Inbreeding on Age at First Calving:

Results obtained in Table (4) and (5) showed that increasing the coefficient of inbreeding was responsible for increasing the age at first calving. The regression of age at first calving on inbreeding was one month of age for every increase of one percent over the average inbreeding; while the correlation between the two traits was 0.607, and these two coefficients were statistically highly significant.

TABLE 4.—AVERAGE AGE AT FIRST CALVING, AND LENGTH OF LACTATION PERIOD FOR THE FRIESLIANS OF HOLLAND

Year	Age at 1st calving (mo)	Lactation periods (days)	Years	Age at 1st calving (mo)	Lactation periods (days)
1915-16. . . . .	—	343	1937-38. . . . .	31	342
1916-17. . . . .	—	302	1938-39. . . . .	29	330
1917-18. . . . .	—	260	1939-40. . . . .	27	324
1918-19. . . . .	—	263	1940-41. . . . .	32	319
1919-20. . . . .	—	301	1941-42. . . . .	27	333
1920-21. . . . .	—	287	1942-43. . . . .	28	332
1921-22. . . . .	—	278	1943-44. . . . .	27	352
1922-23. . . . .	34	302	1944-45. . . . .	33	312
1923-24. . . . .	29	305	1945-46. . . . .	30	341
1924-25. . . . .	31	317	1946-47. . . . .	31	317
1925-26. . . . .	40	300	1947-48. . . . .	29	325
1926-27. . . . .	33	310	1948-49. . . . .	33	330
1927-28. . . . .	31	320	1949-50. . . . .	28	337
1928-29. . . . .	32	310	1950-51. . . . .	29	345
1929-30. . . . .	32	336	1951-52. . . . .	31	330
1930-31. . . . .	30	324	1952-53. . . . .	30	325
1931-32. . . . .	33	330	1953-54. . . . .	30	332
1932-33. . . . .	32	320	1954-55. . . . .	29	328
1933-34. . . . .	34	340	1955-56. . . . .	27	331
1934-35. . . . .	32	325	1956-57. . . . .	27	365
1935-36. . . . .	39	308	1957-58. . . . .	27	275
1936-37. . . . .	33	323	1958-59. . . . .	30	318



Robertson (1954) studying this problem in the British Friesians found that, the age at first calving was not significantly affected with inbreeding.

TABLE 5.—EFFECT OF INBREEDING ON MILK PRODUCTION

Authors	Breed	Regression Coefficient lbs.
Tyler et al (1946) . . . . .	Holstein-Friesian.	— 73. 8
Asker (1948) . . . . .	Jersey . . . . .	— 22
Laben (1950) . . . . .	Graded Friesian .	— 209.8
Laben <i>et al</i> (1955) . . . . .	Holstein-Friesian.	— 209.8
Von Krosigk and Lush (1958) . . . . .	Holstein-Friesian.	— 54
The present work (1966) . . . . .	Dutch Friesians .	— 153.8 (kg)

#### B.—Effect of Inbreeding on Milk Yield:

The results given in Table (6) indicate that milk yield decreased as the coefficient of inbreeding increased. During the last ten year beginning from 1949–50, the coefficient of inbreeding reached its minimum, while milk yield reached its maximum.

Regression coefficient of milk yield on inbreeding was 68.34 kilograms of milk and the correlation between the two characters came to — 0.347. Test of significance showed that the two coefficients were significant at 1% of level, Table (6).

Some studies made by many investigators showed that the regression of milk yield on inbreeding was mostly negative as it is shown in Table (5).

Woodward and Graves (1938) studying the effect of inbreeding on milk production and using a herd of grade Guernsey in U.S.A., found that milk yield was not affected with inbreeding, while, Bartlett and Margolin (1944) reported that it was possible to fix desirable factors for increasing milk and fat production by inbreeding until the coefficient of inbreeding came to 20%.

It should be born in mind that in such analysis one would expect to have the net effect of inbreeding on milk yield as it is most probable that selection for high production should have been exerted to some extent or other during the period of study. Moreover, since the herd book (N.R.S) is open for new entries of animals, the inbreeding is then expected to decrease. Also in such work, extending over a long period of time, the effect of the improvement of the environment cannot be adhered.

TABLE 6.—NUMBER OF ANIMALS, Fx.%, MILK YIELD AND FAT % OF THE DUTCH FRIESIAN CATTLE IN HOLLAND

Year	No. of animals	Fx. %	Milk yield kgs	Fat %	Year	No. of animals	Fx. %	Milk yield kgs	Fat %
1915-16	6	3.125	3900	3.50	1937-38	22	0.150	4900	3.45
1916-17	12	0.900	3547	3.34	1938-39	42	0.800	4250	3.75
1917-18	12	0.240	3760	3.38	1939-40	56	1.130	4400	3.81
1918-19	12	1.200	3470	3.26	1940-41	54	0.540	4440	3.80
1919-20	12	0.001	3970	3.26	1941-42	58	0.781	4320	3.80
1920-21	12	1.200	4160	3.24	1942-43	52	1.150	4200	3.90
1921-22	13	0.210	4020	3.89	1943-44	53	0.900	4350	3.91
1922-23	13	0.450	4037	3.41	1944-45	53	0.630	3630	3.77
1923-24	13	0.300	4560	3.50	1945-46	50	0.952	4000	3.72
1924-25	13	0.940	4370	3.55	1946-47	77	0.740	3900	3.74
1925-26	22	0.001	4700	3.50	1947-48	83	0.700	3940	3.80
1926-27	25	3.030	3900	3.50	1948-49	80	0.185	4210	3.87
1927-28	26	2.410	4076	3.63	1949-50	85	0.860	4300	3.93
1928-29	28	1.850	4160	3.57	1950-51	83	0.500	4750	3.85
1929-30	28	2.240	4310	3.59	1951-52	87	0.440	4250	3.93
1930-31	28	1.200	4500	3.42	1952-53	84	0.600	4200	3.92
1931-32	29	0.900	4420	3.54	1953-54	88	6.600	4450	3.97
1932-33	29	1.200	4560	3.60	1954-55	84	0.500	4120	3.57
1933-34	31	1.640	4025	3.59	1955-56	89	0.530	4300	4.01
1934-35	31	1.500	4500	3.60	1956-57	99	0.200	4125	3.97
1935-35	26	0.800	4600	3.49	1957-58	102	0.600	4700	4.01
1936-37	25	0.700	4540	3.60	1958-59	212	0.500	4250	3.98

Swett et al (1949) in U.S.A., and Robertson (1954) in Britain, found that milk yed decreased with the advance in inbreeding in Holstein Friesians and British Friesians respectively. Winters (1954) however, reported that no significant difference between milk yield in the inbred and outbred Jersey cows, while in case of Friesians, milk yield increased by inbreeding. Sostak (1962) in Soviet Union, found that milk yield of inbreds tended to be more than outbreds.

#### C.—Effect of Inbreeding of Fat Percentage :

Table (6) shows the effect of inbreeding on fat percentage. The results obtained indicate that the average fat percentage of the Friesians in Holland was 3.8% ranging from 3.2% to 4.0% during the first lactation.

Regression of fat percentage on inbreeding came to nearly Zero (being 0.002%) and the correlation coefficient between them was also nearly zero (0.003).

Woodward and Graves (1938) reported that fat percentage in a herd of grade Guernsey in U.S.A. increased with inbreeding. Tyler et al (1946) Asker ((1948), Laben et al (1954) and Von Krosigk and Lush (1958) came to the same conclusion, while Woodward and Graves (1942) during their studies on Holsteins in U.S.A. and Winters (1959) reported that fat percentage was negatively affected with inbreeding.

Robertson (1954), concluded that fat percentage of the British Friesians in Britain was not significantly affected with inbreeding.

*D.—Effect of Inbreeding on Length of The Lactation Period :*

Results obtained indicate that the average length of the lactation period was 328 days, ranging between 260 to 365 days.

The regression coefficient of length of the lactation period on inbreeding came to nearly Zero 0.02 day. This regression was comparatively the lowest regression possibly calculated in this study. Table (4).

The correlation between inbreeding and length of the lactation period was also nearly zero (0.002). Both the regression and the correlation coefficient of this character were not significant at 1% of level.

It could be finally concluded that in respect to the effect of inbreeding on the economic characters of milk production in the Dutch Friesians; the milk yield was the mostly affected character (Table 7). There was a minus regression of - 68.34 Kilograms of milk per lactation for every increase of one percent in the coefficient of inbreeding of the breed. The fat percentage was not affected since there was actually a very weak correlation coefficient and accordingly, a negligible increase. The length of the lactation was also very faintly affected but there was an appreciable influence of inbreeding upon the age at first calving.

TABLE 7.—EFFECT OF INBREEDING ON ECONOMIC CHARACTERS

Character	Average	Regression coefficient	Correlation coefficient
Milk yield (Kg.) .. .. .	4203	-68.34	-0.347
Fat percentage (%) .. .. .	3.76	0.002	0.003
Age at first calving (mo) .. ..	30	1	0.607
Length of lactation period (day) ..	328	0.02	0.002

Actudally there was a highly significant correlation coefficient between the two characters of 0.607 (Table 7) and a regression of one month more in the age of the heifers for every degree of increase in the inbreeding coefficient of the breed over the average.

However, these facts cannot belittle the effectiveness of inbreeding as a method of constructive improvement of the breed. It could be safely suggested that this method if used wisely no harm would result out of its practice.

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## تحليل وراثي لماشية الفريزيان الهولندية وتأثير تربية الأقارب على بعض صفاتها الاقتصادية

### المخلص

تم تحليل ٢١٦٠ نسبا لمجموعة من الحيوانات تم اختيارها عشوائيا من سجل نسب جمعية (N.R.S.) وقد شملت الدراسة سجلات الحيوانات في المدة من عام ١٩٠٩ الى عام ١٩٥٩ أى لمدة خمسين سنة وقد تبين من النتائج أن متوسط معامل تربية الأقارب كان ١٧٪ و ٦٪ لكل من الذكور والإناث على التوالي كما بلغ متوسط معامل تربية الأقارب للأبقار ذات الإنتاج العالى ٣٦٪ .

وقد بلغ متوسط معامل القرابة مستخرجا من ١٠٨٠ زوجا من سجلات الأنساب أختبرت عشوائيا ٣٠٠٪ متراوحا بين صفر٪ و ٤١٪ كما بلغ أيضا متوسط معامل القرابة الداخلى ١٠٪ متراوحا بين صفر٪ و ٣٪ .

وقد أظهرت الدراسة أن ثمانية طلائق تنتمى الى جمعية N.R.S. وثلاثة تنتمى الى جمعية F.R.S. كانت هى الأكثر أهمية خلال هذه المدة إذ بلغت القرابة المباشرة للطلائق الهامة وهى (Willem 2-1496), (Apis-5108) (Heridon - 10148) - (Emir - 1145) - (Contantijn Franse 11881) - (Oldambtster Luctor 17338) (Hasdrubal 12294).

Oldambtster Adema I - 19056).  
وهى كلها من الـ (N.R.S) و (Adema 197-22231) و (Adema - 25437) و (17375)

من F. R. S. هى ١٧٪ ، ١٠.٥٪ ، ٢٠.٥٪ ، ٢١.٠٪ ، ٤٧٪ ، ٢٠.٠٪ ، ١٩٨٪ ، ٣٢٢٪ ، ٨٤٪ ، ٤٠٪ ، ٥١٪ على التوالي كما تبين أيضا أن الطلوقة رقم (١٩٠٥٦) كان الجذ الرابع لهذه الطلائق .

وتبين من النتائج أيضا أن العمر عند أول ولادة يزداد إذا زاد معامل تربية الأقارب وكان بين هاتين الصفتين معامل تلازم قيمته ٦٠.٧ كما ظهر أن هناك انحدار يقدر بمقدار شهر زيادة فى العمر عند أول وضع عند زيادة معامل أقارب الحيوان بمقدار ١٪ .

أما بالنسبة لتأثير تربية الأقارب على إنتاج اللبن فقد كانت هناك علاقة احصائية مؤكدة وسالبة إذ كلما زاد معامل تربية الأقارب بمقدار ١٪ نقص إنتاج اللبن بمقدار ٦٨٣٤ كيلو جم عن المتوسط هذا ولم يظهر أن لتربية الأقارب أى تأثير على نسبة الدهن .