Generation Age of Efficient Milk Cows

Continuing my studies on the subject of the influence of generation age[1], I considered it possible that there might be a similar effect with animals. Upon my request, Mr. HANS EUGSTER, dipl. Ing. agr. ETH, director of the 'Herdebuchstelle des Schweizerischen Braunviehzuchtverbandes', was kind enough to permit me to inspect the efficiency indices of groups of milk-cows descending from different bulls, bulls which he had selected at random.

These indices depend on the excess of the average daily milk quantity after subtraction of the quantum considered as the norm, so that these indices can also be negative. They are further modified in a certain way according to the milk quality.

The results are as follows:

No. of the bull	Generation age (life data)	No. of daughters	Efficiency indices of the daughter cows
1	1 (3)	16	+126
	2 (4)	46	+128
	3 (5)	70	+234
	4 (6)	102	+193
2	1 (3)	125	+156
	2 (4)	156	+184
3	1 (3)	30	+400
	2 (4)	66	+514
	3 (5)	88	+550
4	1 (3)	18	−178
	2 (4)	174	+157
	3 (5)	234	+170
	4 (6)	313	+152
5	1 (3)	23	+304
	2 (4)	30	+306
	3 (5)	44	+435
	4 (6)	83	+317
	5 (7)	107	+350
6	1 (3)	15	+383
	2 (4)	144	+989
	3 (5)	298	+999
	4 (6)	517	+878

It appears that the efficiency indices are in fact distinctly higher in the 3rd generation year of the father bull and begin descending again in the 4th generation year.

However, it is to be kept in mind that the above data could not be statistically completely worked out: for instance, among the cows quoted under a certain year are included those of preceding years. In this way the efficiency numbers indicated are already smoothed in a certain degree so that the real influence of the generation year is obviously even more pronounced than is seen at the first glance from numbers given above.

Thus the hypothesis appears justified that in some general way the 'quality' of descendants depends on the generation age of the male parents. It would be of some interest to apply the 'trinomial tests'[1] to animals also. In this connection it may be mentioned that the particularly 'efficient' bull, bull No. 6, was also generated in the 3rd generation year of his father.

Summary. A connection is made plausible between the efficiency of milk-cows and the generation age of the father bulls.

A. DIETZ-HELMERS

CH-6932 Biogno di Breganzona (Switzerland), 10 June 1975.

[1] A. DIETZ-HELMERS, Experientia *30*, 567 (1974).

Malaria, Favism and Glucose-6-Phosphate Dehydrogenase Deficiency

The relationship between the balanced polymorphisms involved in the hemoglobinopathies of hemoglobin S, hemoglobin C, β-thalassemia, etc., and a putative protection against malaria has attracted considerable interest[1–3]. Glucose-6-phosphate dehydrogenase (G-6-PD) deficiency has also been advanced as a protection against malaria[4–8]. Two difficulties have been noted with respect to the malaria hypothesis and G-6-PD deficiency, however: 1. There is only poor correlation between the distribution of malaria and G-6-PD deficiencies in many areas. 2. The highest frequencies of G-6-PD deficiencies occur in areas where selection *against* them is high from favism, an acute hemolytic anemia associated with the ingestion of fava beans, *Vicia faba*, or exposure to fava pollen ('Baghdad spring fever'). In this communication we suggest that these two problems are related and actually support the malaria hypothesis. Furthermore, we believe selection has occurred to *retain* favism in certain populations rather than eliminate it. Evidence for malaria protection from G-6-PD deficiency has resembled that for the hemoglobinopathies, but has been more difficult to assemble. Zoogeographic and ecological arguments involving the distribution and frequency of various hemoglobins and the incidence of falciparum malaria have been strong for hemoglobin S but somewhat weaker for hemoglobin C, hemoglobin E, etc.[3,9–12].

[1] A. C. ALLISON, Br. med. J. *1*, 290 (1966).
[2] H. LEHMANN and R. G. HUNTSMAN, *Man's Haemoglobins* (Lippincott Co., Philadelphia 1966).
[3] F. B. LIVINGSTONE, *Abnormal Hemoglobins in Human Populations* (Aldine, Chicago 1967).
[4] A. G. MOTULSKY, Hum. Biol. *32*, 28 (1960).
[5] A. C. ALLISON, Nature, Lond. *186*, 431 (1960).
[6] A. C. ALLSION and D. F. CLYDE, Br. med. J. *1*, 1346 (1961).
[7] H. M. GILLES and B. G. TAYLOR, Ann. trop. Med. Parasit. *55*, 64 (1961).
[8] H. KIRKMAN, Adv. hum. Genet, *2*, 1 (1971).
[9] E. BEUTLER, R. J. DERN and C. L. FLANAGAN, Br. med. J. *1*, 1189 (1955).
[10] F. B. LIVINGSTONE, A. Rev. Genet. *5*, 33 (1971).
[11] A. C. ALLISON, Cold Spring Harbor Symp. quant. Biol. *29*, 137 (1964).
[12] A. G. MOTULSKY, Am. J. trop. Med. Hyg. *13*, 147 (1964).