

Note on the genetic history of the Romanian Saddleback (Bazna) pig breed conservation nucleus¹

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ABSTRACT

The Turda nucleus of Romanian Saddleback pigs has been organized in 1950 year. It received some blood from Deutsche Sttelschwein (1950'), from British Saddleback (1960') and from peasants Romanian Saddleback (Bazna) (1980'). His breeding program is of improvement conservation type even the breed is an endangered situation. There are 8 boar families with intra-family selection of males and inter-family crossing of sows, but the size of families and the relationships of boars with the stock are unequal; 38.8 % of sows belong to one boar family and the most important ancestors ($R_{xy}=15.28$; 7.66...%) belong to the some family. Even now the inbreeding is quite small (total 0.051, per generation 0.026) and the effective size incredible large, the inter-see relationships (1.93 %) and the possible inbreeding (0.98%) are bigger and the expected effective size smaller. The nucleus is not yet endangered, but vulnerable; on it depend however the situation of all breed, and the program must be more of conservation type. The present situation seems to be the result of selection of a smaller stock from a big one, where the selection favored the less inbreeding individuals. The generation interval was not use nor for conservation nor for improvement.

Key words: genetic history, Romanian Saddleback pig

INTRODUCTION

Romanian Saddleback named in Romania Bazna, is a native pig breed, find just in Romania, created since 1872 on the Bazna locality-Sibiu department. It is said that is the result of a crossing Mangalitsa sows with Berk boars (Walter 1929). Draganescu suppose that really there were not Berk but Wessex or Essex boars. It was subject to uncontrolled infusion (crosses) with Mangalitsa, Berk, Large White (1890, 1920) and to a controlled infusion with Deutsche Sattelschwein (1950' years) and with British Saddleback (1960' years).

On the EAAP and FAO Data Banc the breed is registered with a wrong international name – Porcul de Banat (Simon1993; World Watch List for

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domestic animal diversity - 3rd ed.). The breed has nothing with the Romanian region Banat and this name facilitate the confusion to other breed- Porcul Alb de Banat. As the animals are black with a white saddle encircling the body, including both front legs, with semi-lop ears, Draganescu (1998) proposed as international name "Romanian Saddleback", the local name being Bazna.

The breed was a community breed of peasants from central Transilvania. On 1950 the first elite farm was organized at the Bontsida Experimental Station. The first National Breeding Program (1972) passed the breed in conservation; the conservation nucleus has been changed to the Turda Experimental Station, where it is up to now and produced boars for the need of private peasants, mainly for self-consumption.

Walter (1929), Radu et al.(1952,1960), Farcas et al (1981), Nagy et al.(1999) studied the spreading area, the exterior and the productive characteristics. Derlogea et al. (1958) studied the effect of inbreeding. The phenotypic change of characteristics is accepted as the effect of selection but there are not research on the breeding method and its effect. Our study is a preliminary research on breeding method, on the genetic history of the conservation nucleus.

MATERIAL AND METHODS

The pig pedigrees of nucleus are kept since 1950 year. There were some difficulties on their utilization and the study was made for the time being just on the basis of three generation pedigrees of 36 sows and some 16 incomplete generation of 8 boars present at 31.12.2001 on the nucleus. The generation interval, the relationship and the inbreeding was calculated by Wright (1925) methods, considering each pedigree as having 8 lines (Drăgănescu 1970).

RESULTS AND DISCUSSION

1.Type of breeding plan

The used breeding plan, typical since 19th century in Romania for small elite farms, is a type of conservation program, aiming a minimum increase of inbreeding per generation, using within family selection of some 8 male families ("blood lines"), and rotational crossing of females. Such plan is a conservation plan as the male families' size tend to be equal (Drăgănescu 1970, 1972, 1983, 1984, 1986, 1989).

The initial number of sows was in 1953 year of 29 with 8 boars. On 1968 there were 99, on 1991 - 170 and at 31 December 2001- 36 sows. It seem that the number of boar families was more or less constant-8, even the observed number of boars changed from 8 (1953 year), to 20 (1991) and to 10 (2001). Perhaps sometimes a family was lost, because a boar has been bought from a small peasant farms in 1982 year; his family is present up to now (L-172 M).

From the repartition of males and females per male families, presented on the table 1, it is visible that the breeding plan is not strictly a conservation one; the directed selection acted. The families have not an equal number of females and of males. One family had in the moment of investigation no sow and to other family (L 193) belong 3888 of sows and 20 of boars. The performance was perhaps as important as the inbreeding avoidance.

Table 1 Weight of different sire families (31.12.2001)

Sire family		Active sows		Active boars	
No	HB	No	%	No	%
I	L 127 M	1	2.77	1	10
II	L 253	5	13.88	1	10
III	L 529	4	11.11	1	10
IV	L 221	5	13.88	1	10
V	L 193	14	38.88	2	20
VI	L 152	2	5.23	1	10
VII	L 121	5	13.88	2	20
VIII	L 15	-	-	1	10

2. Important ascendants

The analysis of relationships of the sows with different ancestors and of inter-see relationships support the below conclusions (table 2 and 3). The most important ancestors (boars 093-046/98, 056-034/97, 003-054/95) belong to the some male family (L 193). Just two other relatively important boars belong to other two families. As a result in the future is a danger of inbreeding on the most important boars. The inter-see relationships -1.93% (table 3) point out a possible inbreeding of 0.96, much more that the inbreeding observed now.

Table 2 Important ancestors

Male family	Ancestor	R(xy)% with females
V	093-046/95	15.28
	056-034/97	7.64
	003-054/95	7.29
III	186-057/95	5.90
IV	050-002/96	5.90

3. Inbreeding and Effective Size

From the size of observed population (36 sows and 10 boars) the effective size in a random breeding case is of some 31.3 ($4 \times 36 \times 10 / 36 + 10$) and the expected increase of inbreeding per generation of some 0.8%. ($1/2 \times 62.4$). If intra-family selection of males and females, and inter-families crossing is practiced the effective size can increase up to 62.6 ($4 \times 62 \times 1 / 2$) and the expected

increase of inbreeding by generation decrees to some 0.8% ($1/2 \times 62.4$). Perhaps the within family selection of females and the strict rotational crossing of females between males families was not practiced and a result Derlogea (1958) found many cassis of higher inbreeding.

The inbreeding found by us total (all was current) 0.051 %, per generation 0.026 - is much smaller than the expected and possible one. We suppose that the present stock resulted by selection from a much bigger one. Selection of it favored the individuals with a smaller inbreeding. For the future, as we told, the inter-see relationships point out a much larger possible inbreeding and smaller effective size. One more the breeding program is one of prudent improvement, of improvement and conservation.

Table 3 Inbreeding, inter-see relationships and effective size

Total F(x)%	Generation no	F(x)% per generation	Current F(x) %	Inter-see R(xy)%	Possible F(x) %	Ne
0.051	2	0.026	0.051	1.93	0.96	1960 (!)

4. Generation interval

The average interval between generations found by as was 2.12 years (table 4), smaller on the sire-son side (1.75 year). It seem that the increase of generation interval was not used as conservation means and the selection of boars on progeny testis basis was not applied, even the carcass and grow performance recording was done.

Table 4 Interval between generations

Interval	n	Years	%
Sire-son	108	1.75	82.5
Sire-daughter	144	2.45	115.5
Dam-son	106	2.41	113.6
Dam-daughter	142	2.52	118.8
Average	500	2.12	100

CONCLUSIONS

The Romanian Saddleback (Bazna) breed is an endangered breed, and the Turda nucleus, relatively reproductively isolated since 1950, is the basis for their conservation. The breeding method is intra-family selection of 8 boar families and interfamily sows crossing. The inbreeding is very small (0.51 % total), but is possible that this value is the result of selection who acted during the reduction of the nucleus size; the inter-see relationships (1.93%) suggest a future increase of inbreeding (0.98%). The large variation of family size (38,8 % of sows belong to one family, who have a great relationship to the stock) suggest an active directional selection but also a future increase of inbreeding, of genetic drift and the endangered status of the nucleus and of breed. The

present breeding plan – of improvement-conservation type – must pay more attention to the conservation objective, to avoid of to large variation of family size.

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