SOME FACTORS AFFECTING THE PREVALENCE OF NASAL TURBINATE BONE ATROPHY IN PIGS

G. H. Jackson
Meat and Livestock Commission,
P.O. Box 44, Queensway House, Bletchley, MK2 2EF
England.

While it is known that infection with the bacterium Bordetella bronchiseptica can be involved in turbinate bone atrophy a large number of mangement procedures may be important in precipitating the disease. This paper reports on an investigation into the effect some such procedures may have on the prevalence of the disease.

Materials and methods: The turbinate bones of 390 pigs slaughtered from the Meat and Livestock Commission's commercial pig evaluation unit between September 1979 and June 1980 were examined for atrophy using the method decribed by Done (1964), who recognised six grades varying from grade 0 in which the turbinates fill the nasal cavities to grade 5 in which the turbinates have virtually disappeared. At this station sow productivity and pig growth performance are used to provide an assessment of the genetic merits of breeding stock offered for sale by commercial pig breeding companies.

The pigs assessed in this study came from ten different companies from over fifty different herds. The breeding females were retained for two litters; which were weaned at five weeks when up to five litters from the same company could be mixed. All pigs were reared in the same environmental conditions. Approximately half the pigs were selected at about 20kgs for the feeding trials in which pigs were reared on an ad lib or restricted feeding regime to one of three slaughter liveweights, pork (61kgs) bacon (87kgs) or heavy hog (116kgs) so making six test types in all. Pen size was the same for all test types but population density varied from eight pigs per pen for pork, six for bacon and five for heavy hog. Straw was generally available from birth to slaughter. Halquinol was the only routine medication given to the pigs to prevent post weaning scours.

Results: The overall results (Table I) indicate that there was little serious turbinate bone atrophy present in the herd. Clinical observations made on the pigs during their lifetime revealed no apparent disease and no treatment for rhinitis was carried out.

Table I. Overall Turbinate Assessment

Snout grade	0	1	2	3	4	5	Total exam.	Mean snout grade
no exam	251	97	30	12	0	0	390	0.49
%	64	25	8	3	-	-		

The percentage of pigs in different snout grades broken down into the progeny of different parities and number of litters mixed at weaning is shown in Table II.

Table II. Percentage of Pigs in Different Snout Grades

Snout grade	0	1	2	3	4	5	Total exam.
By parity							
gilt litters	63	26	9	2	-	-	224
2nd litters	67	23	6	4	-	-	166
By mixing litters							
no mixing	65	24	9	2	-	-	101
two mixed	71	19	7	3	-	-	152
three mixed	56	35	7	2	-	-	96
four mixed	59	27	7	7	-	-	41

Chi-squared tests carried out on the data in Table II did not reveal any significant differences ($P>0.05$) between gilt and second litters or the number of litters mixed at weaning on the prevalence of the disease.

The percentage of pigs in each snout grade in the six different test types is shown in Table III. There were no significant differences ($P>0.05$) between the test types and the prevalence of atrophy.

Table III. Percentages of Pig in Different Grades by Test Type

Snout grade	0	1	2	3	4	5	Total exam.
pork restrict	70	26	3	1	-	-	103
bacon "	71	19	9	3	-	-	75
heavy hog "	60	27	7	5	-	-	40
pork ad lib	62	22	14	3	-	-	65
bacon "	68	23	5	5	-	-	62
heavy hog "	44	40	11	4	-	-	45

Data between test types was pooled to examine the effect of feeding regime and slaughter weight on the prevalence of the disease but no significant differences were found ($P>0.05$).

The effect of the age of the pig at slaughter on snout grade was examined. Pigs were grouped, irrespective of test type, into four ages i) up to 125 days, ii) 126-150 days, iii) 151-175 days and iv) over 175 days but there was no indication of any differences between the groups.

The performance of piglets pre weaning and their subsequent snout grade is shown in Table IV. The differences were not considered significant. The results for grade 3, which is used as a quick check on changes in the prevalence of the disease, were based on only twelve pigs. In addition it should be remembered that a greater number born alive could account for the lower weaning weight.

Table IV. Preweaning performance and subsequent snout grade

Snout grade	0	1	2	3	4	5
Av no born alive	10.9	10.8	10.7	11.2	-	-
Av birth weight(kg)	1.45	1.47	1.49	1.45	-	-
Av weaning weight(kg)	9.5	9.6	9.6	9.1	-	-

Conclusions: In this herd with no clinical atrophic rhinitis several factors were examined but had no effect on the prevalence of turbinate atrophy. Firstly it is often stated that the progeny of gilt litters and the mixing of litters predisposes to the disease but this was found not to have occurred. Such factors could be important of course under different environmental conditions or where there is more serious clinical or pathological disease. It was possible that atrophy was more prevalent in pigs not selected for the feeding trials but this is considered unlikely. Secondly no differences could be found in the level of atrophy between the four age groups of pigs considered. It is possible however that the effect of test type could confound the effect of age though this is again considered unlikely. As the skull of the pig grows very rapidly in the first seven months of life any small differences between age groups could simply be a reflection of the normal anatomical variations occurring at this time. It is surprising that such a low level of atrophy was observed in pigs bought from a variety of sources. Strict pre-entry health control procedures are important in allowing such a control testing programme to operate without interference from respiratory disease however. Findings on over 1100 snouts examined since 1977 have shown the disease to have remained at this low level. It is planned to investigate other factors using this larger sample.

Reference: Done, J.T., Richardson, M.D. and Herbert, C.N.(1964). Rhinitis of Swine : a survey carried out in Britain in 1956-57. Animal Disease survey No. 3 HMSO.