

USE OF RISK FACTORS OBTAINED IN A SURVEY AS BASIS FOR PREVENTION OF POSTWEANING DIGESTIVE DISORDERS IN THE PIG

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Une enquête d'épidémiologie analytique est conduite dans les élevages porcins français avec pour objectif la recherche des facteurs de risque de la pathologie digestive du porcelet au sevrage. Les résultats ont abouti à la sélection d'une combinaison de facteurs de risque. Le présent travail consiste à utiliser les résultats de l'étude précédente pour bâtir un programme d'intervention dans les élevages concernés par cette pathologie. Quatre élevages sont choisis en raison de troubles diarrhéiques et de mortalité survenant régulièrement après le sevrage. Une première cohorte de porcelets est considérée sur laquelle l'intensité de la pathologie est mesurée ainsi que les facteurs de risque. Un profil initial de l'élevage sur les facteurs de risque est ainsi obtenu. Au cours d'une seconde étape sur une cohorte suivante en accord avec l'éleveur, des modifications sont intervenues dans la conduite des animaux. Elles visent à la correction de facteurs de risque défailants. Un nouveau profil est obtenu sur les facteurs de risque et le niveau de la pathologie est de nouveau mesuré. Dans les élevages les changements intervenus dans les profils se sont accompagnés d'une amélioration sensible et durable de la santé. Il est conclu que :

- *la pathologie digestive du sevrage peut-être combattue en adaptant la zootechnie,*
- *ce type d'approche qui met l'accent sur la notion de profil de risque est appropriée à la lutte préventive contre les maladies enzootiques multifactorielles.*

INTRODUCTION

As the piglet at weaning is leaving the maternal dependence especially with respect to nutrition and immunity, it becomes susceptible to digestive disorders. In addition numerous other changings abruptly often occur at weaning as the litters are broken off, as hence the pigs are mixed and usually moved to a new facility. Postweaning digestive disorders in the pig are known to be a main concern since many decades in most countries. The classical medical methods are expensive and show rapidly their limits so that the health situation remains rather precarious in many herds despite the use of drugs. A survey was designed in France with the objective to find out the farm management conditions associated to the problems in order to implement preventive measures. This survey gave out a combination of risk factors. The present paper deals with the use of this list of factors to implement a programme for the prevention of the disorders in the field.

MATERIAL AND METHODS

Four farms were chosen on voluntary basis. Their size and housing system were very common in the country. The farrowing and postweaning rooms had a fully slatted floor. They were all concerned for several months by postweaning digestive disorders, the latter showing a different clinical picture depending on the farm. In one case (farm IV) mortality due to oedema disease was the major problem.

A first check was carried out aiming at measuring the risks which were taken. The check list of 13 risk factors that came out of the previous large scale survey (106 farms, 12 000 piglets involved) was used. Each factor was a quantitative variable which could be split into different levels (classes). Depending on the level, the variable was found to be a more or less risky condition. Most of the factors concern precisely a given batch of piglets but others are broader ones and related to the whole herd. It was found that the success of postweaning phase regarding health and growth was already prepared during suckling period. However the conditions offered in the postweaning facilities were found to be most critical.

The principle of the present work was to perform a first check in the farms by measuring the 13 factors on a batch of pigs starting which suckling period. On the basis of the profile obtained, discussion took place about the analysis of the technical and financial situation of the farm. Decisions were taken in order to reduce the risks by changing the levels of the most failing parameters of the profile. On some occasions the farmer was rapidly convinced of the main points which had to be improved. In other cases it needed more effort since he did not see any direct causative relationship between the risk factor and the disorders. The priority was given to the factors which showed in the original survey the highest odds ratio and hence considered as the heaviest. But practical considerations lead us to adapt a strategy to each situation. As often as possible farmer's compliance was searched. Table I shows the situation at the first and at the second check so that the changings that occurred in the mean time can be seen. The period of time between the two checks varied from 1 to 3 months.

RESULTS

- In farm I a special effort was directed at an improvement of the reception conditions of the piglet in the postweaning rooms. The room was perfectly cleaned including the pit beneath the slatted floor, temperature was now 24°C when the piglets entered (instead of 15°C previously). Ventilation system was rectified in order

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to prevent noxious gases to come up from the pit during postweaning phase. Ammonia level remained below 10 ppm and relative humidity remained in the range 60-80 %. The score on respiratory diseases became better. Creep feed intake increased by changing the feeders and the procedure of feeding. Among other changings the number of pigs/pen and stocking density were considerably reduced. Feeding system was also changed in postweaning rooms and probably in relation with all these modifications postweaning feed intake increased.

- In farm II the focus was made on pen stocking and on creep feed intake. On the other hand hygiene level could not be modified as we wanted.
- Farm III profile was close to farm I profile, except weaning weight which was lower. In this case emphasis was made on hygiene, climate and creep feeding procedure.
- In farm IV where the piglets were weaned earlier, mortality due to oedema disease was above 10 % on average for the last 9 months. A special care was taken at climate and hygiene.

Table II gives the values obtained for the criteria used to assess health and performance. At the first check farm II was the most affected which diarrhea whereas farm IV showed severe mortality. At the second series of measurements growth rate was improved specially in farm I and IV. Diarrhea prevalence decreased to a low level except in farm II where it persisted despite the related mortality was stopped. In this farm the third check showed a new decline in diarrhea prevalence (data not shown).

Table I
Farm profiles on the risk factors of postweaning digestive disorders

I_a = farm I, first check I_b = farm I, second check
II_a = farm 2, first check etc...

Farm number	I		II		III		IV	
	I _a	I _b	II _a	II _b	III _a	III _b	IV _a	IV _b
Number of piglets	118	132	153	128	122	97	115	117
Hygiene* score (PW room)	6	13	5	8	8	14	11	14
Climate* adequacy (PW room)	6	8	6	8	6	9	4	9
Herd health* level	9	9	14	14	13	13	14	14
Available man power (sow/man)	116	116	83	83	83	83	68	68
Creep feed intake (week before weaning) (g)	150	192	282	365	56	234	180	285
Feed intake 1st week PW (kg)	0,64	1,33	1,2	1,23	0,67	1,17	1,0	1,32
Respiratory clinical signs* (P weaning)	1	3	2	3	1	2	3	2
Age at weaning (days)	27,4	28,2	26,5	27,9	26,4	28,1	18,5	19,4
Live weight at weaning (kg)	8,8	9,3	8,9	9,1	7,07	8,8	6,2	6,01
N° pigs/pen (P weaning room)	39	25	22,7	12	15	15	12	11,5
N° litters concerned/pen (PW room)	10,3	8,6	9,3	7,2	2,3	3,1	7,2	8,3
Through width/pig (PW room)	5	8,0	4,6	8,3	8,0	8,0	6,7	6,9
Space /pig (PW room) (m ²)	0,22	0,33	0,19	0,37	0,33	0,37	0,35	0,35

* These variables are synthetic variables (scores) summarizing several initial measurements. More details can be found in Madec et al, Prev. Vet. Med. in press.

Table II
Level of postweaning digestive disorders in the farms before and after the changings in the risk factors.

Diarrhea score : 0 = absence, 1 = presence ;scoring /pen/day ; average for the followed pens
P.W = postweaning PWD = postweaning disorders
D0 = day of weaning D28 = 28 days postweaning

Farm number	I		II		III		IV	
	I _a	I _b	II _a	II _b	III _a	III _b	IV _a	IV _b
Number of piglet involved	118	132	153	128	122	97	115	117
Daily gain (g, D0-D28 PW)	314	452	323	345	351	376	299	354
Diarrhea score (D0-D28 PW)	10.5	1.4	23	12	6.8	0.8	0.9	0
% mortality (due to PWD)	0.8	0	4	0	0.8	0.8	14	1.8

DISCUSSION-CONCLUSION

The objective was not here to evaluate the role of each of the risk factors but to try to solve the problem on the farms by implementing a programme on the basis of the results of a previous survey. The parallel measurements of the health indicators showed a significant improvement in health and performance. The strength of the situation was tested through a third check that corroborated the second one . Nearly one year after the 1st check,