

INDUCERS OF PARAMUNITY.VIII. CONTROL OF THE CONDITIONED INFECTIONS
IN SWINE BY MEANS OF BIOLOGICAL INDUCERS (°)

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Generally, infections in swine intensive farms are conditioned and result from interactions among organisms, animals, environment, feeding and breeding systems; yet, they are also supported by opportunistic organisms such as viruses, bacteria, protozoa, mycetes and yeasts acting singly or associated. Their control with specific vaccines has been often unsatisfactory: the involved factors have no microbial origin and the agents are numerous. A different prophylaxis relying on factors such as weaning, transport, microclimate, different feeding and housing was adopted. The animal specific natural resistance was also strengthened (Mayr et al., 1979a; 1979b). The preliminary results of laboratory and field trials are reported. A paramunity inducer (POLI-IF) of the kind previously given to calves was used (Galassi 1979; Galassi et al. 1979; 1980; 1981).

MATERIALS AND TECHNIQUES: 1. POLI-IF, an emulsion consisting of: a) Purified and inactivated NDV, titred 10^{10} EID₅₀ per ml; b) Endotoxin of *E. coli* from a 3.10 bacteria/ml suspension; c) Incomplete Freund's adjuvant (IFA). 2. **Lab animals and infection routes:** a) Albino mice, Swiss, of 22 to 25 g; b) Albino guinea-pigs, Pirbright strain, of 450 to 500 g; c) Pregnant sows and piglets of different age, of Landrace X Large White crossbreed.

In safety tests rodents had 2.0 ml POLI-IF/Kg l.w., s.c. or i.m.; sows and piglets 1.0 ml/25 Kg l.w. and 1.0 ml/2.5 Kg l.w., s.c., respectively. In efficacy tests sows had 5.0 ml POLI-IF s.c. at 60 and 100 days pregnancy; newborn piglets 1.0 ml s.c. when aged 3 and 13 days; piglets over 4-week age had 2 injections of 2.0 ml s.c. with a 10-day interval in between.

TECHNIQUES: a) Ordinary haemochromocytometric exams; b) titration of circulating interferons (IF) (Galassi, 1979). Smallpox vaccine virus grown on swine kidney cells was used as a detector; c) the serial globulin rate was determined electrophoretically.

RESULTS. 1. The safety tests on lab rodents were positive and only a small granuloma at the injection spot was seen. In sows and piglets, besides the said granuloma, a rise in temperature and anorexia rarely occurred 24 hrs post infection. 2. The efficacy of POLI-IF in laboratory was evaluated indirectly as the experimental infection with opportunistic agents is of a hard fulfillment; clinically, topical and general reactions previously reported under safety tests were seen; haematological tests had negligible changes in the haemoglobin rate and in red series elements. An increase in leucocytes of POLI-IF-treated pigs occurred too. It was seen after both POLI-IF injections with a peak after 12 hrs and ended within 3 days.

The relation mono/polynucleates (in controls being 2.2) after POLI-IF treatment differed markedly. 12 hrs after the 1st treatment the relation had mean values of 3.4, then it lowered suddenly. 24, 48 and 72 hrs after treatment it was below the average. After the 2nd treatment the above relation remained below the average for 3 days and at the 24th hr it reached the lower peak (mean values of 0.9). Serum globulins after 2 POLI-IF injections with a 10-day interval in between had a low and unsteady increase. The rate of circulating IF in peripheral blood increased markedly 12 hrs after treatment with POLI-IF; it kept high for 24 hrs then lowered and disappeared 72 hrs after injection. The 2nd injection of POLI-IF, 10 days after the 1st one, caused a reaction

analogous to the previous one, its values being slightly higher. The peaks of single animals never exceeded 500 U/ml. The use of POLI-IF in problem-herds was satisfactory. Given to pregnant sows and later to newborn piglets it reduced the occurrence of neonatal enteritis. In Table 1 the results obtained in a controlled farm are reported. Microbiologically, examinations of dead animals showed *Streptococcus haemolyticus*. The virological cultures grown on pig kidney cells were negative.

TABLE 1: POLI-IF field trials on pigs from problem-herds

	Treated	Controls
Pregnant sows	13	13
Piglets born	110	114
Diseased piglets	28 (25.4%)	99 (86.8%)
Dead before weaning	4 (3.6%)	25 (21.9%)
Discarded before weaning	1 (0.9%)	7 (6.1%)

The mathematical and statistical treatment of the results was scarcely significant in the difference of the animals discarded before weaning. Highly significant ($P < 0.005$) was the difference in the incidence of conditioned infections and mortality. The mean duration of conditioned infections in POLI-IF-treated animals was constantly shorter. Piglets reacted to antibiotic treatment and/or chemotherapy and their gain in weight had no stop as it had happened in controls.

Conclusions:

Prophylaxis is not always possible with specific vaccines. Infections from opportunistic agents can be easily controlled with stimulators of the paramunitary resistances. POLI-IF mobilizes the aspecific natural defences of animals, increases leucocyte number and circulating interferons, modifies the leukocyte formula. Though the modalities which regulate these phenomena are still unanswered, nevertheless they are useful in field practice. In problem-herds POLI-IF greatly reduced losses.

Selected references: Galassi, D.; Proc. 21st World Vet. Congr., Moscow 1979 (in press); Galassi, D., Monaldi Marinozzi Maria Verena, Pelliccioni, A., Atti SISVET, 1979, 33:286.; Ibid., Atti SISVET, 1981, 35: (in press); Galassi, D., Pelliccioni, A., Monaldi Marinozzi Maria Verena, Il Nuovo Progresso Veterinario, 1980, 35: 1179; Mayr, A., Raettig, H., Stickl, H., Alexander, M., Fortschr. der Med., 1979a, 97: 1159; Ibid., Fortschr. der Med., 1979b, 97: 1205.

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