

HOMEOPATHY VERSUS ANTIBIOTICS IN METAPHYLAXIS OF INFECTIOUS DISEASES: A CLINICAL STUDY IN PIG FATTENING AND ITS SIGNIFICANCE TO CONSUMERS

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Context • Due to the conditions of modern industrial pig fattening in intensive livestock farms, 24% to 69% of the animals become ill. The antibiotic metaphylaxis that is routinely administered leads to several problems in animals, human health, and the environment.

Objective • To investigate whether a homeopathic metaphylaxis is effective and potentially useful for replacing antibiotic metaphylaxis.

Design • Animal subjects were divided into groups of 10 per pen, 2 pens sharing 1 trough. Twenty pigs were randomly assigned within a stall and were administered either antibiotics, homeopathy, or placebo.

Setting • A typical intensive livestock farm in Northern Germany.

Participants • 1440 piglets.

Intervention • Homeopathic metaphylaxis is compared with placebo, the routine low-dose antibiotic metaphylaxis, and an antibiotic metaphylaxis in therapeutic dosage.

Main Outcome Measures • Incidence of diseases in general and of diseases of the respiratory tract.

Results • Homeopathic metaphylaxis is significantly effective compared with placebo and routine low-dose antibiotic metaphylaxis for incidence of disease and rate of disease of the respiratory tract among the animals studied. Only by increasing the dosage of antibiotics to a therapeutic level does antibiotic metaphylaxis surpass homeopathic metaphylaxis.

Conclusions • An unacceptably high percentage of pigs in modern livestock management become ill, suffering mainly from diseases of the respiratory tract. The routine antibiotic dosage of metaphylaxis is too low to be effective. As a result, the problems of resistance and danger to human health and the environment are increasing. To confirm whether antibiotic metaphylaxis may be replaced by homeopathic metaphylaxis, this study should be repeated independently. (*Altern Ther Health Med.* 1999;5(5):64-68)

In Western Europe and North America, pig fattening has become an industrial production process. Hundreds of piglets from many different herds are brought together in modern intensive livestock farms, living for 120 days in an artificial environment until they are slaughtered. Intensive livestock farming involves artificial lighting, air conditioning, computer-aided feeding, and so on. The animals live under stressful conditions and stress-related illnesses are prevalent.^{1,2} The reasons for this stress are as follows: (1) the herding of large numbers of animals of different origins to confined spaces; (2) poor hygienic conditions and poor climate conditions, leading to physical and behavioral stress combined with a high risk of infection; and (3) the attempt to raise animals to be leaner yet have more weight, resulting in a reduction in their ability to withstand stress.^{3,6}

A certain percentage of piglets regularly become ill; statistics from 3 intensive livestock farms in Germany show a prevalence of illness of between 24% and 69%. Such animals most commonly suffer from diseases of the respiratory tract. An investigation involving more than 100 000 pigs in German slaughterhouses in 1994 revealed that one quarter had pathologic lesions of the lung; one third were found to have lesions of the stomach.⁷ Similar findings have been made in other countries.⁸⁻¹⁰

In an effort to prevent such illness, it is common practice to administer medical feed.¹¹⁻¹³ This feed serves as a carrier that contains antibiotics such as chlortetracycline and sulfonamides. Usually the medical feed is administered for the first 10 days after the animals' arrival on the farm. This procedure is called "metaphylaxis" because drugs are administered prophylactically, but after the occurrence of risk. The dosage of the antibiotics and other drugs is a prophylactic one (ie, it is lower than the recommended therapeutic dose). According to the German Department of Statistics, in 1990 more than 625 000 tons of medical feed containing antibiotics was used in Germany. It must be emphasized that few investigations have been conducted to determine the adequate dosage for chemoprophylaxis. Dosage recommendations by drug manufacturers and veterinarians vary widely.

Several problems arise from this practice:

- development of bacterial resistance to antibiotics
- side effects suffered by the pigs

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- feces containing antibiotic residues are used in farming, affecting the food chain

- negative consequences are suffered by consumers^{14,15}

As a result of these problems, the Carstens Foundation in Essen, Germany, established a research priority in the use of homeopathy and alternative therapies in veterinary medicine due to their lack of side effects and fewer residue problems. The research program focused on whether antibiotic metaphylaxis could be replaced by homeopathic treatment and sought to investigate the effectiveness of homeopathic remedies on pigs under the extreme conditions of intensive livestock farming.

To our knowledge, this was the first study ever conducted in Europe on the effectiveness of the routinely used antibiotic metaphylaxis protocol in pig fattening.

MATERIALS AND METHODS

The investigation was conducted between September 1987 and December 1988 at a modern livestock farm (an all-in, all-out facility with a completely slatted floor) in Northern Germany (near Papenburg/Emsland) consisting of 3 separate barns with a capacity of 1440 animals per barn (see Figure). Each barn was divided into 4 stalls with 360 animals each—the standard procedure.

The study was part of an overall investigation with 13 con-

secutive stages involving 360 animals (ie, 4680 piglets) divided into 3 subunits of 120 animals each. In the overall investigation, several chemotherapeutic combinations, several dosages, and different homeopathic combination remedies were compared.^{2,16} The section reported in this article is confined to 12 subunits consisting of 120 animals each (ie, 1440 piglets). Consistent with standard procedure, the piglets (all originating from the hybrid breeding program of Baden-Württemberg) came from at least 100 different breeding farms. During the study the animals were observed over a period of 11 days.

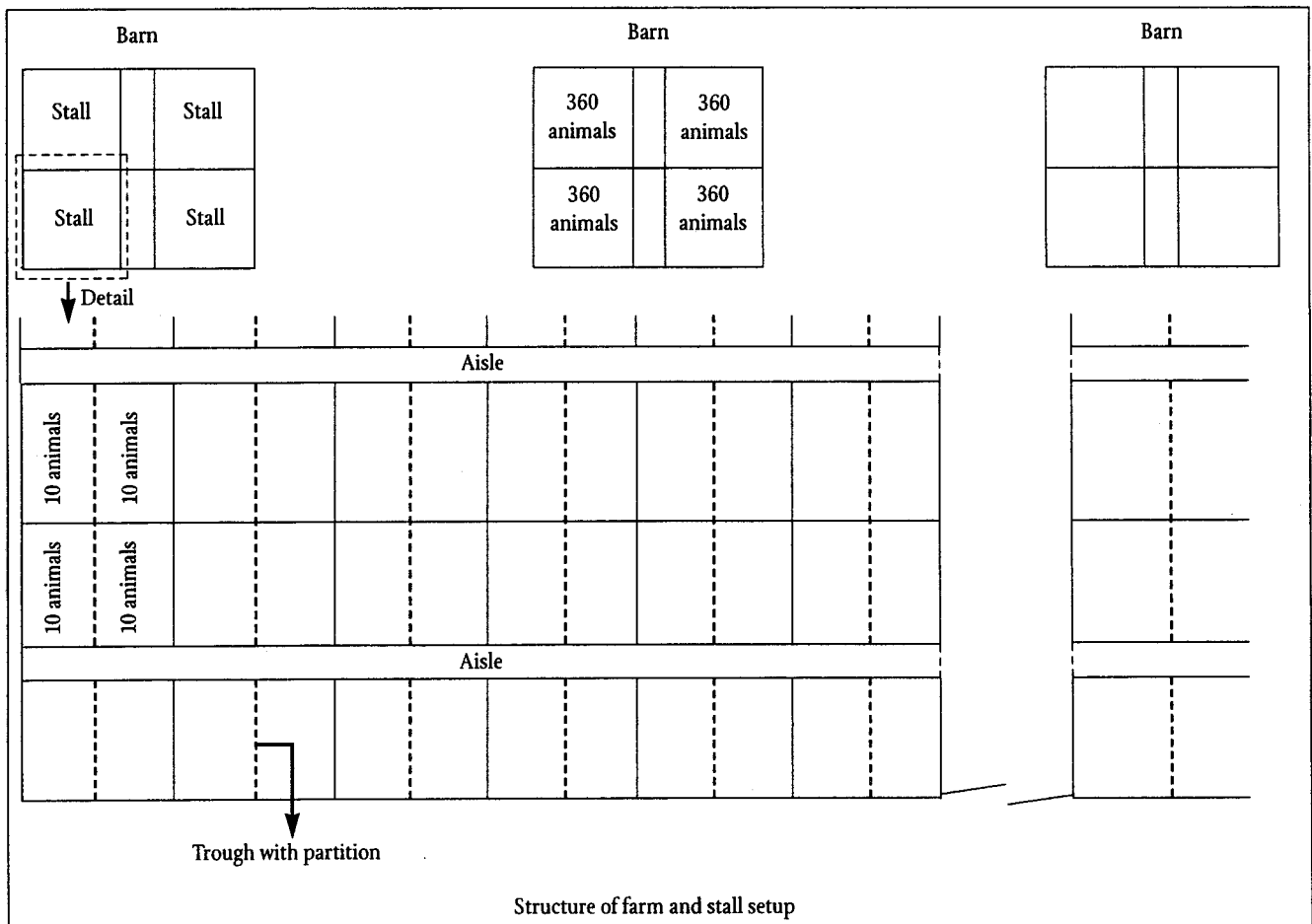
OBJECTIVE OF THE STUDY

The following questions were addressed concerning the anticipated infectious diseases, especially those of the respiratory tract:

1. Can a metaphylactic effect be achieved through the use of a homeopathic combination remedy?
2. Is the routinely used combination of chlortetracycline with sulfonamides in a prophylactic dosage¹⁷ useful for metaphylaxis?

EXPERIMENTAL DESIGN

During the entire investigation, piglets of comparable origin, size, weight, and so on were used. The animals were divided into groups of 10 animals per pen, 2 pens sharing 1 trough. These



medication groups of 20 animals each were randomly assigned within a stall and were administered 1 of 2 antibiotics, homeopathy, or a placebo. Study medications are described in Table 1.

A random code was generated before the initiation of the study. In this manner all medication groups could be influenced equally by microclimate differences in stall climate and a homogeneous exchange of pathogens between the groups could be achieved. Due to the different properties of the medications involved (color and odor), blinding was not possible. Within the entire investigation the same experimental design was repeated in spring, summer, fall, and winter to control influences by stocks and macroclimate.

CONDUCTING THE STUDY

The animals were transported to the farm during the evening. Following assessment of each pig's health status, each was brought to a stall that had been cleaned, disinfected, and empty for 10 days after completion of the last fattening stage. Two days prior to the admission of a new unit of piglets, the building was heated to 18°C, the feeding troughs were cleaned again, and ventilation was controlled. The mean weight of the animals was measured on site prior to housing (25±1 kg per animal in every unit).

On the first day the animals were given water only. A liquid feeding in accordance with the standards in Germany (supplied by a large manufacturer) began on the second day. Administration of the medication took place immediately before feeding to ensure that each animal could receive its designated amount. Medications were dissolved in drinking water 12 hours before feeding. Prior to administration the solution was stirred again. Each trough was filled with 2 L of the solution, enabling each animal to drink 100 mL.

The study veterinarian observed the animals during and after feeding. Each animal exhibiting abnormal behaviors was marked with a colored pen. Diagnosis was based on the following symptoms:

- no or limited food intake
- visible symptoms such as lameness or injuries
- laying down immediately after food intake
- signs of general lethargy
- audible symptoms such as coughing

Following the diagnosis, every marked animal was examined thoroughly, treated, and marked with an ear tag. Each examination was recorded. The entire procedure was supervised by independent veterinarians.

After the registration of all affected animals, the stall microclimate was investigated. Air temperature and humidity in various areas of the building were constantly monitored at animal level (ie, at the same height relative to the animals to ensure the animals' comfort). The amount of ammonia was measured at animal level in every pen daily. At the end of each stage a detailed record of stall climate and its variations in quality could be shown.

The procedure was continued until the 11th day. At this time administration of medication and intensive individual care

TABLE 1 Study medications

Method	Substance	Dosage/potency
Antibiotics/ chemotherapy in prophylactic dosage	Chlortetracycline	12 mg/kg of body weight
	Sulfamethazine	6 mg/kg of body weight
	Dimetridazole	30 mg/kg of body weight
Antibiotics/ chemotherapy in therapeutic dosage	Chlortetracycline	60 mg/kg of body weight
	Dimetridazole	30 mg/kg of body weight
Homeopathic prophylaxis	Cuprum metallicum	D4
	Drosera	D1
	Ipecacuanha	D3
	Ferrum phosphoricum	D4
	Nux vomica	D4
	As fixed drug	3g/animal per day
Placebo	Lactose (milk sugar)	3g/animal per day

were completed. Registration and treatment of further cases of disorders was assigned to the stockman, who had been trained for this particular task. Evaluation and statistical analysis of results were based solely on the data obtained in the first 11 days by the study veterinarian. The data sampled by the stockman afterward served for additional control only.

STATISTICAL ANALYSIS

Odds ratios and relative risks were computed such that values less than 1.0 indicated a lower incidence in the treatment group compared with the placebo control group. Statistical tests on *P* values were based on a 2-sided Yates correction testing the null hypothesis (ie, whether the incidence of disease is independent of the sort of medication being tested). Statistical analysis was performed using the statistics program SPSS (Statistical Package for the Social Sciences).

RESULTS

Homeopathic metaphylaxis with the combination remedy showed a significant reduction of disease rate compared to the placebo. The homeopathic drug was effective in preventing diseases of the respiratory tract. The homeopathic metaphylaxis of diseases of the respiratory tract proved significantly more effective than did the routine antibiotic metaphylaxis (Table 2).

The routine antibiotic metaphylaxis in prophylactic dosage had no effect either on the rate of illness in general or on the rate of diseases of the respiratory tract. Only by increasing the dosage of antibiotics to a therapeutic level (chlortetracycline=60 mg/kg of body weight) did the antibiotic metaphylaxis become effective and surpass the effectiveness of the homeopathic treatment. Antibiotic metaphylaxis in therapeutic

TABLE 2 Incidence of diseased animals in the treatment groups compared with the respective control groups expressed as numbers, odds ratio, and relative risk

Diseased animals in general

Treatment	Antibiotic (prophylactic dose)	Antibiotic (therapeutic dose)	Homeopathy
Treatment: D/ND	63/417	42/198	65/415
Control: D/ND	79/401	100/140	88/392
Odds ratio	.77	.30	.70
95% CI	.53-1.11	.19-.46	.48-1.0
Relative risk	.80	.42	.74
95% CI	.59-1.08	.31-.57	.55-.99
P value	.15	.000	.043

Animals suffering from respiratory conditions

Treatment	Antibiotic (prophylactic dose)	Antibiotic (therapeutic dose)	Homeopathy
Treatment: D/ND	56/424	32/208	44/436
Control: D/ND	62/418	82/158	69/411
Odds ratio	.89	.30	.60
95% CI	.59-1.33	.18-.48	.39-.91
Relative risk	.90	.39	.64
95% CI	.64-1.27	.27-.56	.45-.91
P value	.56	.000	.012

D indicates diseased; ND, not diseased

dosage is also effective in respiratory diseases. The difference compared to homeopathy was not statistically significant.

DISCUSSION

Although these results were published in the largest German journal for veterinary medicine,¹⁶ there has been no further attempt to study homeopathic metaphylaxis. Antibiotic metaphylaxis in prophylactic dosage is still being practiced throughout Germany, though results of this study demonstrate that the procedure is ineffective. Investigations in slaughterhouses suggest that the health status of pigs, especially in the respiratory tract, continues to be a problem.^{7,10,18}

The risk of contamination with germs that are resistant to antibiotics used in human therapy increases.¹⁵ Serious danger to health and even life have increased, as the World Health Organization has emphasized.¹⁹ Residue from feces used in farming seeps into the water table and eventually finds its way into crops or directly into the human organism.¹⁵ There is evidence that antibiotic metabolites are reactivated in liquid feces and can be detected in soil and plants for weeks.²⁰ Because of this, the potential role of homeopathy in this field should be considered.

This study suggests that antibiotic metaphylaxis might potentially be replaced by homeopathic metaphylaxis to aid in control of stress-induced disease. The results are remarkably solid considering the study was conducted with a multiple repeated design. Homeopathic metaphylaxis combined with an improvement of general conditions of livestock farming may decrease the percentage of diseased animals to an acceptable level.

CONCLUSIONS

Based on these results, sufficient evidence exists to continue investigation of homeopathy as a potential metaphylactic replacement for antibiotics. It is in the best interests of consumers that the study be repeated independently as soon as possible. The study was conducted using a very simple mode of homeopathy (ie, a fixed combined drug). The use of homeopathy in this situation would therefore be easier, more practical, and more economical than the current therapeutic practice.

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