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A randomized controlled trial of homeopathic treatment of weaned piglets in a commercial swine herd

FRM Soto^{1,*}, ER Vuaden², CdP Coelho³, NR Benites⁴, LV Bonamin⁵ and SS de Azevedo⁶

¹Veterinarian, Ph.D., University of São Paulo, São Paulo, Brazil

²Homeopathic Veterinarian, M. Cassab - Animal Nutrition, São Paulo, Brazil

³Homeopathic Veterinarian, Master, University of São Paulo, São Paulo, Brazil

⁴Homeopathic Veterinarian, Ph.D., University of São Paulo, São Paulo, Brazil

⁵Homeopathic Veterinarian, Ph.D., Paulista University, São Paulo, Brazil

⁶Veterinarian, Ph.D., University of Campina Grande, Patos, Paraíba, Brazil

Abstract: Aim: To evaluate the zootechnic performance and occurrence of diarrhea in piglets in the week post-weaning comparing supplementation with sucrose saline which contained or did not contain added homeopathic medicine.

Method: Animals were randomly divided into three groups of 24 piglets each. The control group did not receive any treatment. Another group received sucrose saline, and the third group received sucrose saline with homeopathic medicine added, in the period of zero to seven days post-weaning. The homeopathic treatment consisted of *Echinacea angustifolia*, *Avena sativa*, *Ignatia amara*, *Calcarea carbonica*, all 6cH. Piglets were weighed daily for weight gain or loss, and observed for diarrhea and feed intake.

Results: Animals receiving sucrose saline alone and sucrose saline with homeopathy had less weight loss than control ($p = 0.017$, $p = 0.0001$ respectively). There was no statistical difference in relation to overall incidence of diarrhea or food consumption. These data suggest that the supplementation with sucrose saline with added homeopathic medicine in the first seven days post-weaning may be an useful option to reduce weight loss in weaned piglets. *Homeopathy* (2008) 97, 202–205.

Key words: piglets; weaning; sucrose saline; homeopathy

Introduction

The main objective of the swine industry is to maximize meat production. The most important factors that interfere with this objective are genetic lineage of stock, breeding hygiene, management and nutrition.¹ The first weaned days of piglets are critical for their development, and can influence performance of the next stages and prejudice the weight of slaughtered swine. The body weight gain of piglets in the first weeks post-weaning can be absent or negative.²

Among the possible causes of hygiene problems and economic losses, digestive diseases are prominent. These may cause diarrhea or sudden deaths, loss of weight, prejudiced alimentary conversion and underweight resulting in rejection for slaughter. 80–90% of diarrhea in weaned piglets and the consequent economic losses occurs in the first seven days after weaning, due to high stress levels.³ Antibiotics and drugs have been added to piglets' food to reduce these problems. However, most antibiotics used as additives in animal food were prohibited in Europe in 1999.^{4,5} There is worldwide interest in the identification of new products and technologies to reduce animal development losses.⁶

Homeopathic veterinary medicine has yielded promising results in terms of solutions to control swine herd problems and to improve productivity especially in relation to zootechnic outcomes.⁷ The addition of sucrose saline containing homeopathic medicine in the post-weaning phase

*Corresponding author. Francisco Rafael Martins Soto, University of São Paulo, Zoonoses and Sanitary Surveillance, Caixa Postal 34, CEP 18150-000 Ibiúna, São Paulo, Brazil.

E-mail: chicosoto@ig.com.br

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Table 1 Total and individual weight (mean ± standard deviation), at the beginning, fifth day and at the end of experimental period, and accumulated loss of weight in kilogram (kg), in the different experimental groups

Group	Individual weaned weight ^a	Individual weaned weight at day seven ^a	Total weaned weight	Total weight at the seventh day post-weaning	Cumulative loss of weight	Final loss of weight (%)
Control (n = 24)	6.48 ± 1.08	5.87 ± 1.18	155.60	141.00	14.60	-9.38
Sucrose saline (n = 24)	6.47 ± 1.08	6.22 ± 1.26*	155.40	149.40	6.00	-3.86
Sucrose saline and homeopathic complex (n = 24)	6.04 ± 0.69	5.99 ± 0.9**	145.10	143.80	1.30	-0.89

*p < 0.05, **p < 0.01 compared to control.

^a mean ± Standard deviation.

has two advantages: it is palatable to the piglets and helps to maintain electrolyte balance, with possible diminution in the incidence of dehydration and loss of weight.

The homeopathic complex we used was based on study of the homeopathic materia medica and the well-documented phytotherapy effects of *Echinacea angustifolia*.

The aim of this study was to evaluate the zootechnic performance and the occurrence of diarrhea in piglets treated with sucrose saline containing or not containing a homeopathic complex, in the first week post-weaning, compared to untreated control.

Material and methods

The experiment was performed in a commercial swine herd, with complete cycle and 180 sows in the Municipality of Ibiúna, São Paulo State, Brazil. Seventy two genetically related piglets weaned at the age of 21 days and with mean weight of 6.33 kg were selected. The animals were randomly divided in three groups of 24 piglets, males and females equally distributed. Two days before weaning, all piglets were identified in the ear by the Australian marking system in order to facilitate the evaluation of individual parameters of daily weight and the occurrence of diarrhea.

Piglets were maintained in the nursery in individual stalls of floor half-lath work, density of three animals per m², environmental mean temperature of 23 °C and water *ad libitum* from four watering places via sucking tube. Animals were fed with a mixture consisting of powdered maize, soy and powdered milk, vitamin and mineral supplement, available *ad libitum* in automatic feeders. Food nutrient content was 18.4% protein, 7.00% lactose, 4.09% total lipids, 2.74 % fiber, metabolic energy 3518 Kcal/kg, 1.46% lysine and 0.505% methionine.

Sucrose saline was given in disinfected 100L plastic reservoirs connected to a water sucking tube for each 12 animals. The sucrose saline contained 40 g of sucrose and 3.5 g of commercial sodium chloride per litre of drinking water. The sucrose saline solution was divided in two equal fractions: sucrose saline only and sucrose saline with added homeopathic complex. The homeopathic complex consisted of *Echinacea angustifolia*, *Avena sativa*, *Ignatia amara*, and *Calcarea carbonica* all 6cH in 30% ethanol, prepared according to the Brazilian Homeopathic Pharmacy.⁸ The homeopathic medicine was administered in the volume of five mL/100L of water twice a day, at 7:00 and 17:00 hours.

Throughout the experimental period, the following parameters were evaluated daily:

- Individual evaluation: gain or loss of weight and occurrence of diarrhea in the piglets. Diarrhea was determined by visual analysis of excrement with three scores: 1- feces with normal consistency; 2-soft, not firm feces; 3- liquid, watery feces. Score 3 was considered diarrhea. Observations were grouped and the percentage of diarrhea incidence was calculated as the sum of times that score 3 was observed in relation to the total of observations^{9,10}
- Evaluation of experimental and control groups: food consumption and gain or loss of weight per group.

For the comparison of quantitative variables (total group weight, individual weight and food consumption) the Kolmogorov-Smirnov¹¹ normality test was performed. As all variables showed normal distribution, one-way analysis of variance¹¹ was used for between-group comparison and the Tukey test for multiple comparisons.¹¹ To compare occurrence of diarrhea, we used the chi-square test or Fisher's exact test, as indicated.¹¹ p < 0.05 was considered

Table 2 Daily number of piglets that showed diarrhea (%)

Group	Days post-weaning								Total
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	
Control	0	0	0	12 (50.0)	9 (37.5)	12 (50.0)	2 (8.3)	0	35
Sucrose saline	0	2 (8.3)	4 (16.7)	15 (62.5)	3 (12.5)	1* (4.2)	0	0	25
Sucrose saline and homeopathic complex	0	5* (20.8)	6* (25.0)	19 (79.2)	2* (8.3)	0*	2 (8.3)	0	34

*p < 0.05 compared to control.

Table 3 Total food consumption, daily and individual means from zero to seven days post-weaning in different groups

Group	Total consumption	Daily consumption mean per group ^a	Daily consumption mean per piglet
Control	24.50	3.06 ± 1.54	0.127
Sucrose saline	26.30	3.29 ± 1.34	0.136
Sucrose saline and homeopathic complex	25.70	3.21 ± 1.52	0.133

^a mean ± Standard deviation.

significant. The program *SPSS for Windows* version 13.0 was used.

Results

Table 1 shows total and mean individual weights and respective weight changes. Piglets of the sucrose saline and homeopathy group were lighter at trial entry than those of the other two groups, but the difference was not significant. For loss of weight, a significant difference was found on comparing control with sucrose saline ($p = 0.017$) and control with sucrose saline and homeopathy ($p = 0.0001$). Within group weight loss was significant in control ($p = 0.0001$), sucrose saline ($p = 0.008$) but not in the sucrose saline and homeopathy group. There was no statistical significant between-group difference in the total number of piglet days of diarrhea (Table 2) or food consumption (Table 3).

Discussion

The addition of sucrose saline and homeopathic medication for weaned piglets may be a viable alternative to reduce losses in the weaning period. This is of interest since the use of most antibiotics used with as additives in animal food was prohibited in Europe in 1999.^{4,5} The zootechnic effects of this homeopathic complex in association to the sucrose saline is shown in Table 1: there was almost no loss of weight in piglets during the first week of weaning. The reduction of losses in this period are reflected in more rapid weight gain in subsequent phases, with reduction of the mean age of slaughter and greater final weight.¹² There were no significant between-group differences overall in the incidence of diarrhea. The incidence of diarrhea was higher for sucrose saline and homeopathy in days one and two after weaning, but had little influence in the weight loss of the animals, control group piglets were the most affected with enteric diseases in days four and five ($p = 0.001$).

It should be noted that, by chance, the homeopathy treated animals were lighter at trial entry than the animals of the other two groups, their better performance might be attributable to 'catch-up' growth. Also that the sucrose saline only group had the lowest total of diarrhea days of all three groups. Neither of these differences reached statistical significance.

There were no significant differences in food consumption, however, a tendency to greater food consumption was observed in the sucrose saline and sucrose saline and

homeopathy treated groups. This may be of interest since greater food intake in the first post-weaning days is associated with greater weight gain in the final fattening phase.^{6,13,14} Food consumption is modulated by intrinsic and extrinsic factors, and stress can reduce consumption.¹⁵ In one experiment, animals treated with an homeopathic medicament consumed more food than controls under stress.¹⁶

In intensive animal raising systems, knowledge of the factors that interfere in weight gain and feed conversion is fundamental to good productivity. Studies based of these factors have examined the association of water with food flavouring and sweetener in the post-weaning phase, due to the positive relation among ingestion, food consumption and weight gain.^{6,13,14}

There has been recent interest in the utilization of homeopathic preparations as zootechnic method means to increase productivity in several areas of animal husbandry. Some examples: Rajkumar *et al.* reported that the treatment of anoestrus cows with a homeopathic complex (*Calcarea phosphorica* 30c, *Aletris farinosa* 30c, *Pulsatilla* 30c, *Aurum muriaticum natronatum* 30c, *Sepia* 30c and *Phosphorus* 30c) was effective in inducing oestrus. All treated animals conceived and their serum oestradiol concentration was increased. The overall conception rate was 54.5% with 1.83 services per conception. The authors concluded that the homeopathic complex medicine might be effective and economical in the treatment of true anoestrus condition in cows.¹⁷

Berchieri *et al.* found that nosodes prepared from *Salmonella enterica* serovar *enteritidis* and administered into the drink water of chicks ($n = 180$) reduced bacteria growth from cloacal swabs.¹⁸

Aziz and Enbergs showed that the treatment of fresh bull ejaculates with different potencies of monensin (5x up to 14x) resulted in significant increase of mitochondrial activity measured by flow cytometry without negative effects on sperm viability.¹⁹

The present study contributes to this new zootechnical approach, in which homeopathy and isotherapy can be proposed as useful, non-toxic tools.

Conclusion

The addition of sucrose saline and homeopathic medication for weaned piglets may be a viable alternative to reduce losses in the weaning period. This is of interest as an alternative to the use of antibiotics as animal food additives.

References

- 1 Sobestiansky J, Barcellos D, Mores N, Carvalho LF, Oliveira S. *Clínica e Patologia Suína*. 2nd edn. Goiânia: Universidade Federal de Goiás, 1999. 464pp.
- 2 Maenz DD, Patience JF, Wolynetz MS. Effect of water on the performance of newly weaned pigs offered medicated and unmedicated feed. *Can. J. Ani. Sci* 1993; **73**: 669-672.
- 3 Borowski SM, Barcellos DESN, Stepan AL, Oliveira SJ. Sensibilidade a antimicrobianos de amostras de *Escherichia coli* isoladas de suínos apresentando diarreia no período pós desmame. *Arg. Fac. Vet. UFRGS* 1994; **22**: 24-30.
- 4 Laval A. Use of antibiotics in swine production: advantages and limits. The problem of antibioresistance. In: Congresso Brasileiro de Veterinários Especialistas em Suínos, 9, 1999, Belo Horizonte. Belo Horizonte, ABRAVES: Anais, 1999, p. 1119-1130.
- 5 Boerlin P. Antimicrobial growth promoter ban and resistance to macrolides and vancomycin in enterococci from pigs. *J. Clin. Microbiol.* 2001; **39**: 4193-4195.
- 6 Freitas HT, Ferrera AS, Donzele JL. Manejo para desmama de leitões aos 21 dias de idade. *Rev. Bras. Zootec* 1997; **26**: 753-758.
- 7 Vuaden ER. *Homeopatia na Suinocultura. Monografia (Especialização e Homeopatia Veterinária)*. São Paulo: Faculdade de Ciências da Saúde de São Paulo, Centro de Ensino Superior de Homeopatia, 2005. 97.
- 8 Costa RA. *Homeopatia Atualizada*. Petrópolis: Homeopatia Escola Brasileira, 1988. 273.
- 9 Mores N. *Diarréia pós desmame em leitões*. In: *Mini Simpósio do Colégio Brasileiro de Nutrição Animal*, **10**. Valinhos, Anais, Campinas: CBNA, 1993. 101-115.
- 10 Vassalo M, Fialho ET, Oliveira ALG, Teixeira AS, Bertechini AG. Probióticos para leitões dos 10 aos 30Kg de peso vivo. *Rev. Bras. Zootec* 1997; **26**: 131-138.
- 11 Zar JH. *Bistatistical analysis*. 4th edn. Upper Saddle River: Prentice Hall, 1999. 663.
- 12 Mahan DC, Lepine AJ. Effect of pigs weaning weight and associated nursery feeding program on subsequent performance to 105 kilograms body weight. *Journ. Anim. Sci* 1993; **69**: 1370-1378.
- 13 Heimig D. Why 78% of feeds chose liquid system. *Pigs* 1996; **12**: 6-9.
- 14 Silva CA, et al. Edulcorante na água de consumo e efeitos sobre o desempenho e desenvolvimento da mucosa intestinal de leitões submetidos ao desmame precoce segregado. *Rev. Bras. Zootec* 2000; **29**: 1770-1776.
- 15 Lopes J, Gamarro GD, Prediger E, Dalmaz C. Efeito do estresse crônico variável sobre o comportamento alimentar de ratas ooforectomizadas. Online. Disponível na Internet via www: URL. <<http://seberi.propeq.ufrgs.br/cdsalao2001/salao01/cb01.pdf>>; 2004. Arquivo recuperado em 19 de abril de.
- 16 Coelho CP, Almeida VD, Pedrazzoli Neto M, Duran Filho C, Zincaglia LMC, Bonamin LV. Therapeutic and Pathogenetic animal models for *Dolichos pruriens*. *Homeopathy* 2006; **95**: 136-143.
- 17 Rajkumar R, Srivastava SK, Yadav MC, Varshney VP, Varshney JP, Kumar H. Effect of a Homeopathic complex on oestrus induction and hormonal profile in anoestrus cows. *Homeopathy* 2006; **95**: 131-135.
- 18 Berchieri A Jr., Turco WCP, Paiva JB, Oliveira GH, Sterzo EV. Evaluation of isopathic treatment of *Salmonella enteritidis* in poultry. *Homeopathy* 2006; **95**: 94-97.
- 19 Aziz DM, Enbergs H. Stimulation of bovine sperm mitochondrial activity by homeopathic dilutions of monensin. *Homeopathy* 2005; **94**: 229-232.