

Case Report

SUCCESSFUL TREATMENT OF *SALMONELLA ENTERITIDIS* INFECTION IN COMMERCIAL LAYERS WITH ORGANIC ACIDS BLEND (*ORGACIDS**)

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SUMMARY

A commercial layer farm was found to be perpetually infected with *Salmonella enteritidis* over the past two years. Despite the management resorting to various antibiotics as a means of control, it was observed that *S. enteritidis* and other *Salmonella* spp. were not eliminated though the organisms were being regularly isolated. The situation was compounded by the presence of drug resistant bacteria and antibiotic residues in table eggs which are known to be harmful to consumers. Organic acid blend (*Orgacids**) was introduced to this layer farm with a dosage of 0.15 and 0.30% per ton of feed. The combination was able to eliminate *S. enteritidis* after 0.30% *Orgacids** feed was fed for 28 days, followed by feeding 0.15% of *Orgacids** subsequently. *Orgacids** is a 'green' acidifier product, with no residue and resistant gene found. It appears to be an alternative to antibiotics in livestock and poultry husbandry.

Keywords: *Salmonella enteritidis*, organic acid blend, antibiotics, poultry

INTRODUCTION

Antibiotics have been used to control and prevent pathogenic bacteria in livestock and poultry for decades. The use of antibiotics has increased resistance in human and animal pathogens. An organic acid blend (*Orgacids**) has been suggested as the alternative (Jensen, 1998). A number of studies have been conducted on organic acid blends against pathogens (Zunita, 2004). Based on the bactericidal activity of *Orgacids**, the objective of this study was to determine the bactericidal activity of an organic acid blend (*Orgacids**) against *S. enteritidis* in a commercial layer farm.

CASE REPORT

An *Orgacids** experimental trial was conducted in a layer farm with the capacity of producing 400,000 eggs per day. This layer farm was tested positive for *Salmonella*

enteritidis (40 out of 100 cloacal swab samples) over the past two months. The poultry were treated with antibiotics but sampling revealed the poultry to be still positive for *S. enteritidis* and other *Salmonella* spp (Sira, 2003). Due to the concerns of developing antibiotic resistant strains of pathogenic bacteria and antibiotic residues in table eggs, all layers producing eggs for human consumption are not allowed to be given antibiotics. Therefore, *Orgacids** was recommended as the choice (green product) to replace antibiotics in this layer farm.

Incorporation of *Orgacids** in the feed was introduced to curb pathogens. *Orgacids** at a rate of 0.3% per ton of feed was introduced to layer houses 2 & 6 (80,000 birds per house) for 4 weeks (pre-lay, just allocated from pullet) and followed by 0.15% of *Orgacids** per ton of feed until culling at 80 weeks. During this period, cloacal swabs and fecal samples were taken at random on the 28th day from 100 birds per house at each sampling. The results are shown in Table 1

Table 1: Presence of *S. enteritidis* in the layers before and after administration of *Orgacids**

| Sampling day | House 6 | | | |
|-----------------|-----------------------------------|----------------------------|----------------------------|---------------------------|
| | 0 (Pre- <i>Orgacids*</i> feed) | 28 (3.0 kg for 28 days) | 56 (1.5 kg for 28 days) | 84 (1.5kg for 28 days) |
| Bacteria tested | SE | SE | SE | SE |
| Cloacal Swabs | 40 Positive | Negative | Negative | Negative |
| Fecal Swabs | | Negative | Negative | Negative |

Note: 40 of the 100 samples collected tested positive for *S. enteritidis* before *Orgacids** was added to the feed

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Table 1: Continued from previous page

| House 2 | | | | |
|-----------------|--------------------------|---------------------------|----------------------------|---------------------------|
| Sampling day | 0 (Pre-Orgacids*feed) | 28 (3.0kg for 28 days) | 56 (1.5 kg for 28 days) | 84 (1.5kg for 28 days) |
| Bacteria tested | SE | SE | SE | SE |
| Cloacal Swab | 40 Positive | Negative | Negative | Negative |
| Fecal Swab | | Negative | Negative | Negative |

Note: 40 of the 100 samples collected tested positive for *S. enteritidis* before *Orgacids** was added to the feed

DISCUSSION

Table 1 (houses 6 and 2) shows that 40 out of 100 collected cloacal swab samples were positive for *S. enteritidis*. This was prior to the incorporation of

*Orgacids** in the feed of this commercial layer farm. Following the testing, *Orgacids** was added at a rate of 0.3% per ton of feed for 4 weeks (just allocated from pullets) for houses 6 and 2. All 100 cloacal samples and 100 faecal swabs were tested for *S. enteritidis* after 4

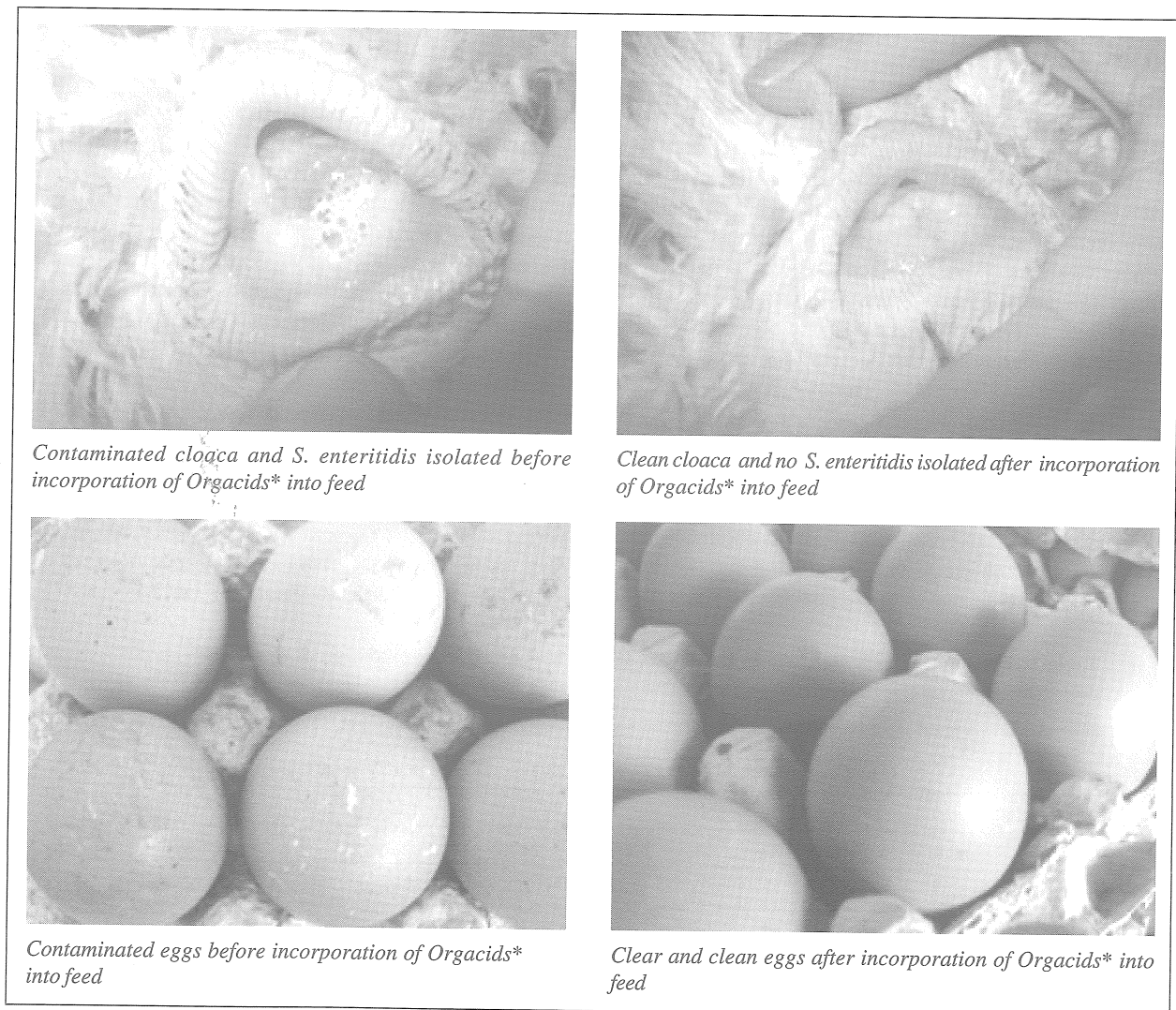


Figure 1: Cloacae and eggs from layers before and after administration of *Orgacids**

weeks of *Orgacids** feed intake. Subsequently, the incorporation rate of *Orgacids** was reduced to 0.15 % which was continued till culling at 80 weeks. The above results showed that incorporation of 0.15 % of *Orgacids** into feed was able to effectively control *S. enteritidis* which was evident from all 100 samples of cloacal swabs and faecal samples being negative for *S. enteritidis*. This was evident after treatment for 28 days. These results indicate that *S. enteritidis* is sensitive to an acidic environment regardless of the concentration of *Orgacids**. Previous reports have similarly shown that *S. enteritidis* is inhibited by 0.15% *Orgacids** (Zunita, 2004; Chiou, 2007).

In conclusion, an inorganic acid blend (*Orgacids**) was effective in controlling and inhibiting the growth of *S. enteritidis*. This should serve as an alternative to antibiotics in the feed of livestock and poultry. *Orgacids** is an antibacterial acidifier; it is a 'green' product that is safe for use in animal and poultry industries. The use of *Orgacids** in place of antibiotics should further reduce the development of drug resistant animal pathogens.

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