

Efficacy of non antibiotic feed additives to treat post weaning diarrhoea in piglets

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Abstract

A field trial on efficacy of Salcochek against weaning diarrhoea of piglets was undertaken. Twenty five White Yorkshire piglets of one month age irrespective of sex were divided into five different groups. Twenty piglets were diarrhoeac and 5 were healthy. Group A-C was treatments, comprising diarrhoeac piglets only. Group A piglets were treated with Ciprofloxacin-Tinidazole tab at the rate of 10 mg/kg body weight for 3-5 days. Group B was treated with mixture of Salcochek at the rate of 0.5kg/tonne of feed and Ciprofloxacin-Tinidazole at the rate of 10mg/kg body weight for 3-5 days depending upon severity of condition. Group C piglets were treated with Salcochek at the level of 1kg/tonne of feed for 3-5 days depending upon severity of condition. Group D was positive control, comprising of untreated diarrhoeac piglets. Group E was retained as negative control, comprising healthy piglet without any history of diarrhoea. Body weight was highest in group B treated with combined therapy of Salcochek and followed by healthy control group E, Salcochek alone treated group C and lastly in Ciprofloxacin - Tinidazole treated group A. Diarrhoeac piglets from group D had subnormal body weight. Ciprofloxacin-Tinidazole treated diarrhoeac piglets recovered in 4 days, while in combined as well as Salcochek alone treated piglets recovered in three days. Mortality of 20 and 60% was recorded in Ciprofloxacin-Tinidazole treated and untreated diarrhoeac piglets respectively, while there was no mortality in Salcochek treated groups. It can be concluded that Salcochek is efficacious in treatment of diarrhoea in piglets.

Keywords: Herbal; Salcochek; diarrhoea; weaning piglet; antibiotic

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Introduction

Recently weaned piglets are stressed by nutritional, psychological, environmental and physiological factors and are variously predisposed to enteric disorders (Hampson, 1994). Post-weaning diarrhoea (PWD) is a multifactorial gastrointestinal disease associated mainly with proliferation of enterotoxigenic *Escherichia coli* in the intestinal tract of affected pigs (Vondruskova et al., 2010; Laine et al., 2008). It causes an increase in morbidity and mortality rates, high cost of treatment also pigs that recover from illness are often stunted and grow slowly causing considerable economic loss to the pig producers (Hong et al., 2006; Hampson et al., 2001). An outbreak of diarrhoea requires medication

often with antibiotics. Rampant use of which has raised resistant pathogenic bacterial strains forcing gradual withdrawal of antibiotic promoters from pig diets (Vondruskova et al., 2010). European Union in 1999, banned the use of antibiotics as growth promoters in animal feed and ban was completely enforced in 2006 (Smith et al., 2010; Sarmah et al., 2006). Possibility of expansion of similar policy to other parts of globe has shifted the research scenario to obliged development of alternative strategies for maintenance of animal health and performance (Castillo et al., 2008). Various natural materials such as probiotics, prebiotics, organic acids, plant extracts have been tested as effective alternatives to antibiotics (Vondruskova et al., 2010). Phytogenic feed additives are claimed to exert antioxidative,

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antimicrobial, and growth-promoting effects in livestock, actions that are partially associated with enhanced feed consumption (Windisch et al., 2008). Also these additives exert beneficial actions within the digestive tract, such as laxative and spasmolytic effects, as well as prevention from flatulence (Chrubasik et al., 2005).

Salcochek (*Supplied by M/s Ayurved Ltd. Baddi, HP, India*) a polyherbal antidiarrhoeal and gut function modulator is enriched with pre-standardized herbs. Its constituent herbs adsorb & inactivate enterotoxins, hence claimed to control the damage of gastro intestinal mucosa. Its herbal ingredients are scientifically proven to impart hepatoprotective, gastro protective, antibacterial and antiviral activity (Vasanthakumar et al., 2012). Therapeutic efficacy of Salcochek against enteric disorders has been documented for positive impact on gut ecosystem and immune status in broilers (Baishya et al., 2009; Mahajan et al., 2011; Vasanthakumar et al., 2012). The present study was aimed to evaluate the efficacy of herbal formulation of Salcochek in treatment of weaning diarrhoea of piglets.

Materials and Methods

One month old aged 25 White Yorkshire growing piglets were selected for the experimental study and divided into 5 equal groups. Out of which 20 were diarrhoeac and rest five were healthy and constituted negative control. Group A piglets were treated with Ciprofloxacin-Tinidazole tab at the dose rate of 10mg/kg body weight for 3-5 days. Group B were treated with mixture of Salcochek at the rate of 0.5kg/tonne of feed and Ciprofloxacin-Tinidazole tab at the rate of 10 mg/kg body weight for 3-5 days depending upon severity of condition. Group C piglets were treated with Salcochek at the rate of 1kg/tonne of feed for 3-5 days depending upon severity of condition. Diarrhoeac piglets from Group D were not given any treatment and kept as positive control. Group E was negative control, comprising healthy piglet without any history of diarrhoea. All piglets were observed daily till four weeks for clinical signs e.g., appetite, colour and consistency of faeces, temperature, pulse rate and overall appearance of animal. Efficacy of treatments was established in terms of recovery of clinical signs, average weekly body weight gain, number of treatments required for recovery, total duration of treatment and mortality if any. The data from the study was pooled and was subjected to suitable statistical analysis as described by Snedecor and Cochran (1994).

Results

Clinical recovery

Diarrhoeac weaned piglets demonstrated dehydration, ill-thrift, pasty to liquid yellow to brown

faeces, loss of appetite etc. All diarrhoeac piglets except group D were treated with various treatment schedules for 3-5 days. Liquid pasty faecal output was turned to solid to semisolid accentuating the efficacy of therapy in treated groups. Incorporation of Salcochek as therapeutic resulted in hastening the recovery in three days itself while in Ciprofloxacin-Tinidazole treated group recovery took place in 4 days. Diarrhoeal and untreated weaned piglets from group D remained dull, dehydrated leading to worsening of clinical signs and eventually 60% overall mortality was recorded. Refractory to Ciprofloxacin-Tinidazole therapy where 20% mortality of piglets was noticed. Salcochek exhibited the therapeutic as well as immunopotentiating activity and none of mortality was recorded in group B and C.

Body weight (Kg)

Weekly average body weight has been summarized in Table 1. Overall body weight gain in each group as estimated to 4th week had an ascending trend in weight gain. All treated and healthy control piglets were having significantly higher ($P<0.05$) body weight to that of positive control group D (2.08 ± 1.23). Highest weight was recorded in Salcochek and Ciprofloxacin-Tinidazole combined treated piglets (4.84 ± 0.38) followed by healthy piglet group (4.7 ± 0.2), Salcochek alone (4.48 ± 0.22) and lastly in Ciprofloxacin-Tinidazole alone treated group (3.68 ± 0.25).

Discussion

The weaning process increases the stress on piglets, and thus their susceptibility to viral and bacterial infections. It is the leading cause of piglet mortality, subnormal body weight and subsequently hampering the progress of pig industry. Weaning weight is considered as one of the most important factors influencing post-weaning and lifetime growth performance (Lawlor et al., 2002). All diarrhoeac treated piglets attained higher body weight than untreated piglets. However, the overall weight gain in all the groups, healthy control as well as diarrhoeac and treated piglets was comparatively lower than normal range. This may be attributed to the reason that the weaned piglets were not offered with balanced ration under field conditions. Mortality in diarrhoeac untreated piglets (60%) was highest amongst all groups. It has been estimated that diarrhea in a suckling period occurs in 0-50 (100) % litters, especially in the first week of life and mortality can range up to 60-70% of sick animals (Hall, 1989; Svensmark et al., 1989). Phytogenic feed additives were also reported to stimulate intestinal secretion of mucus in broilers, an effect that was assumed to impair adhesion of pathogens and thus to contribute to stabilizing the

Table 1: Weekly average (mean± S.E) body weight (Kg) of different treatment groups

Week	A	B	C	D	E
0 week	2.88±0.18 ^a	3.44±0.43 ^a	2.96±0.36 ^a	4.00±0.16 ^a	3.02±0.14 ^a
1st week	3.18±0.22 ^b	3.78±0.47 ^a	3.2±0.12 ^a	4.12±0.18 ^a	3.34±0.21 ^a
2nd week	3.6±0.36 ^b	4.02±0.45 ^b	3.56±0.19 ^b	3.34±1.34 ^b	3.74±0.21 ^b
3rd week	3.88±0.42 ^{bc}	4.4±0.4 ^{bc}	4.0±0.12 ^b	2.68±1.44 ^{bc}	4.18±0.22 ^b
4th week	3.68±0.25 ^b	4.84±0.38 ^{bc}	4.48±0.22 ^{bc}	2.08±1.23 ^{bc}	4.7±0.2 ^{bc}

Means bearing different superscript in a column are significantly different at P<0.05

microbial eubiosis in the gut of the animals (Jamroz et al., 2006). Herbal antidiarrhoeal product Salcohek comprises of a number of herbal ingredients namely Aegle marmelos, Holarrhena antidysenterica, Berberis aristata, Punica granatum, Acacia catachu scientifically known for their gastroprotective, antidiarrhoeal and immunostimulating activity (Sack et al., 1982; Gupta et al., 1992). Growth promoting feed additives relieve the host animals from immune defense stress during critical situations. It stabilizes feed hygiene, affects the ecosystem of gastrointestinal microbiota through controlling potential pathogens and increases the intestinal availability of essential nutrients for absorption. Thereby they help the animals to grow better within the framework of their genetic potential (Eckel et al., 1992; Roth and Kirchgessner, 1998). Moisture excretion through excreta and colonization of beneficial bacteria such as *Lactobacilli* spp. and *Bifidobacterium* spp. in the intestine and reduction in enterotoxigenic *Clostridium* spp. load were comparatively better in Salcohek supplemented groups (Vasanthakumar et al., 2012). Broilers with induced Colibacillosis had significantly higher feed intake, higher body weight gain and better feed conversion efficiency when treated with Salcohek (Mahajan et al., 2011).

Conclusion

Based upon the findings, it can be concluded that Salcohek can be administered either alone or in combination with suitable antibiotic for treatment of post weaning diarrhoea in piglets as per the severity of condition.

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