



Article: ANDCID PERFECT

Autors: AND-Nutrition Veterinary team

andCID Perfect is not a simply acidifier, it is the perfect blend between different components, which are able to give an excellent intestinal health, the right growth and control the microflora.

Why?

Because their components are:

- Organic acid: the supplementation of organic acids at the right high doses in animal feed can increase the bodyweight, improves feed conversion ratio and reduces colonization of pathogens in the intestine.
- Butyrates: is a known essential ingredient for restoring intestinal health. The active component is butyric acid, a short chain fatty acid, natural component of animal metabolism. We supply coated butyrate that will act in the intestine.
- Fructooligosaccharides: special prebiotic fiber. After they are consumed, fructooligosaccharides move to the large intestine to stimulate the production of microbiota in colon and intestinal tract.

Why formic acid?

It is well known the beneficial effects of organic acids, they decrease the pH of the feed and stomach, increase the digestibility of the proteins, bactericide and bacteriostatic effect, reduce the digestive problems and act as a growth promotor. The option we have chosen for andcid perfect is formic acid, because its MIC (minimal inhibitory concentration).

| Bacteria | Formic acid [%] | Propionic acid [%] | Lactic acid [%] |
|--------------------------------|-----------------|--------------------|-----------------|
| <i>Salmonella typhirium</i> | 0.10 | 0.15 | 0.30 |
| <i>Escherichia coli</i> | 0.15 | 0.20 | 0.40 |
| <i>Campylobacter jejuni</i> | 0.10 | 0.20 | 0.25 |
| <i>Staphylococcus aureus</i> | 0.15 | 0.25 | 0.40 |
| <i>Clostridium botulinum</i> | 0.15 | 0.25 | 0.30 |
| <i>Clostridium perfringens</i> | 0.10 | 0.25 | 0.30 |

This table shows the excellent MIC, that the formic acid presents.

We add this good with the benefits of the butyric acid, to support to the animals with the best intestinal health.



Some effects of the butyric acid:

- Increases feed intake.
- Increases the action of all the enzymes throughout the digestive tract.
- Improves the villi health, that could be damaged after weaning or stressful situations, not also in its size, but also in the junction of the cells in the intestinal walls.
- Increase the absorption of nutrients.
- Increases development of beneficial intestinal flora, and inhibit the growth of pathogenic bacteria and fungi (prebiotic effect).
- Natural source of energy for intestinal cells.

And to support the good effects of the combination of formic acid and butyrate, we add the benefits of the a prebiotic fiber, the fructooligosacharides, well known as FOS. Our FOS come from natural sources.

Reduction of the intestinal pH has been shown in case of FOS administration. Also the increase the number of good microflora as *Lactobacillus* and *Bifidobacterium*, and reduces the number of dangerous pathogens, such as *Salmonella* and *Campylobacter*.

HOW TO USE ANDCID PERFECT?

| Animals | In Feed |
|--|-----------|
| Piglets 6-11 kg | 3-5 kg/Tm |
| Piglets 11-25 kg | 2-4 kg/Tm |
| Fattening pigs (>25Kg) | 1-2 kg/Tm |
| Broilers | 1-2 kg/Tm |
| Layers | 2 kg/Tm |
| Layers (>350 days, to improve egg quality) | 4 kg/Tm |

In Practice:

For Broilers, turkeys and other birds:

1. Reduce/remove the digestive disorders. Reduce the % of wet beds.
2. Increase the growth. Reduce the Feed conversion ratio.
3. Reduce the number of antibiotic treatments.



For Layers:

1. Reduce the intestinal disorders. Reduce the % wet beds.
2. Increase the egg production
3. Decrease the broken eggs.
4. Increase the quality of the egg shell.

For piglets:

1. Reduce/remove the intestinal disorders.
2. Increase the growth. Reduce the feed conversion ratio.
3. Decrease the use of antibiotics.

For fattening pigs and sows:

1. Reduce/remove the deaths by *Clostridium perfringens*.
2. Increase the growth in fattening pigs.

Some bibliography:

Due to their antimicrobial activities and their beneficial effects on pig performance, organic acids have proven to be an efficient alternative to in-feed antibiotics in modern pig production systems. It has to be emphasized that this effect is more pronounced in weaning rather than fattening pigs. (**Gabert and Sauer, 1994; Roth and Kirchgessner, 1998**).

The most likely mechanisms, by which organic acids improve feed conversion ratio and animal health, include acidification, either of the feed or of the stomach, and/ or selective inhibition of pathogenic intestinal micro-organisms. They may also be absorbed along the digestive tract, providing an additional energy source for the animal (**Roth et al., 1993**).

Supplemental organic acids and their salts mainly act in the proximal part of the GIT (stomach and small intestine). The beneficial effects of organic acids cannot be simply attributed to the acidification of the intestinal content, because neither HCl nor phosphoric acid (which are known as 'strong acids'), improve growth rate or feed conversion in piglet trials. It is likely that the anion is responsible for the beneficial effects of these acids, as it controls bacterial populations in the upper intestinal tract.

(Roth and Kirchgessner, 1998).

Organic acids have been identified as best alternative to antibiotic growth promoters (AGPs) as they act like AGPs and control the enteric pathogens which compete for



essential nutrients with GI microflora. Other beneficial effects of organic acids include improvement in digestive enzymes activity, microbial phytase activity, increased growth of intestinal mucosa which increases overall growth performance (Adil, 2010)

Feed Acidifiers As Natural Growth Promoters in Poultry. Feed Gopal Krishan and Asmita Narang

The mode of action of acidifier in poultry will be mainly due to its anti microbial action and not like in pig farming on the reduction of the stomach-pH. It is therefore of high importance to balance the acidifier according to this approach. The effect on gram-negative bacteria is increased if the organic acid is not dissociated. Because of this mode of action acidifier need to contain organic acids which are undissociated at different pH values, so that the anti microbial action is prolonged over a wider pH range. In this trial increased animal performance could be monitored. Especially the final body weight of the treated broiler chicken was significantly increased. But also the other performance data showed better results. Average daily weight gain was higher in the acidifier group, partly significantly and the FCR was slightly reduced, even if this reduction was not significantly

Acidifier – a modern alternative for anti-biotic free feeding in livestock production, with special focus on broiler production Christian Lückstädt, Nizamettin Şenköylü, Hasan Akyürek, Aylin

“Sodium butyrate exerted its favorable effect in 3,6 - to 24,2 - fold lower concentrations than the organic acids (citric acid, fumaric acid, propionic acid) used earlier. With respect to its favorable biological and economic effect, sodium n-butyrate can be recommended for use in pig feeding as a growth promoter.”

Feeding trial in pigs with a diet containing sodium n-butyrate. Gálfi P, Bokori J. Department of Physiology, University of Veterinary Sciences, Budapest, Hungary.

“The Na-butyrate has a complex trophic effect on the gastrointestinal epithelium in adults. These results suggest that supplementation with Na-butyrate may enhance the development of jejunal and ileal mucosa in formula-fed piglets”

Effect of sodium butyrate on the small intestine development in neonatal piglets feed by artificial sow. A. Kotunia¹, J. Woliński¹, D. Laubitz¹, M. Jurkowska¹, V. Romé², P. Guilloteau², R. Zabielski

“We conclude that butyrate enhances the intestinal barrier by regulating the assembly of tight junctions. This dynamic process is mediated by the activation of AMPK. These results suggest an intriguing link between SCFA and the intracellular energy sensor for the development of the intestinal barrier.”

Animal Nutrition Development Group, S.L.

Calle Arriaga 194. La Chopera. 28231 Las Rozas (Madrid) Spain www.andnutrition.com

+34685862942



Butyrate Enhances the Intestinal Barrier by Facilitating Tight Junction Assembly via Activation of AMP-Activated Protein Kinase in Caco-2 Cell Monolayers^{1,2}, Luying Peng^{3,5}, Zhong-Rong Li⁴, Robert S. Green³, Ian R. Holzman³, and Jing Lin.

“Butyrate caused a 78– 119% increase in cell proliferation in the ileum, distal colon, jejunum, and cecum ($P \leq 0.002$). Thus, at an entry rate into the colon within the physiological range, butyrate caused increased intestinal cell proliferation. Thus, intracolonic butyrate may enhance intestinal growth during infancy. “

Cecal Infusion of Butyrate Increases Intestinal Cell Proliferation in Piglets¹ C. Lawrence Kien, et al.

Many different nutrients, such as pectins, cellulose and xylanes, favour development of various intestinal microorganisms. Prebiotics should not be extensively metabolised, but should induce targeted metabolic processes, thus bringing health benefits to the host's ecosystem. The best documented benefits are associated with the use of indigestible oligosaccharides, such as fructans and galactans. That phenomenon is explained by, among others, easy degradability of bonds present in the structure of fructo-oligosaccharides (FOS) and galacto-oligosaccharides (GOS) by certain enzymes, such as β -fructanosidase and β -galactosidase, commonly occurring in *Bifidobacterium* genus bacteria. Some types of nutritional fibre may be considered prebiotic. Prebiotics play a significant role in nutrition of both livestock and home pets. When assessing the effect of prebiotics on health, one has to take into account the fact that all groups of animals mentioned above differ in terms of anatomy, physiology, nutrition, intestinal microbiota and habitat.

Prebiotics most commonly used in livestock nutrition are: FOS, GOS, inulin, isomalto-oligosaccharides (IMO), xylo-oligosaccharides (XOS), lacticol, lactulose, cereal fibre. When designing the composition of prebiotic formulas, determination of an appropriate dosage is essential. Overdose of prebiotics may lead to flatulence and diarrhoea. On the other hand, a great advantage of that kind of formulas is that they may be used for a long time and preventively, having no adverse effects noted for antibiotics.

However, reduction of the intestinal pH was noted in case of FOS administration at the concentration of 2%. Supplementation of broiler chickens' diet with prebiotics results in reduction of gastrointestinal pH and increased *Lactobacillus* and *Bifidobacterium* counts, caused by increased amount of volatile fatty acids. In their study, Yusrizal and Chen checked the effect of feeding broiler chickens with fructane (of chicory origin) containing feed on growth of birds and length and structure of the intestine of studied animals. The experiment was conducted on 96 broiler chickens, for 6 weeks. An improved body weight gain, feed turnover and

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Calle Arriaga 194. La Chopera. 28231 Las Rozas (Madrid) Spain www.andnutrition.com

+34685862942



reduced serum cholesterol were found. Moreover, feed supplementation with fructanes caused increase of *Lactobacillus* genus bacteria count and reduction of counts of potential pathogens, such as *Salmonella* and *Campylobacter* in the broiler chicken gastrointestinal tract

Administration of fructooligosaccharides at the dose of 4 g/kg feed had a positive effect on the mean daily growth of studied animals, and on growth of Bifidobacterium and Lactobacillus bacteria, with a simultaneous inhibition of growth of Escherichia coli in experimental animals' gastrointestinal tract.

The role of probiotics, prebiotics and synbiotics in animal nutrition

Paulina Markowiak and Katarzyna Ślizewska

Trials done by veterinarians

The use of our product after many years in many farms all over the World makes us have a huge experience, and the possibility to make specific protocols to all the farms.

TRIAL RESULTS

Trials with ANDCID PERFECT IN SOWS

Clostridium in sows – Digestive problems in piglets

PART 1: Clostridium in sows

Target:

To review the use of ANDCID PERFECT (synergic mixture of substances proved to improve the intestinal health, with coated sodium butyrate, formic acid and FOS, and special absorbent substances) to control sudden deaths (caused by CLOSTRIDIUM PERFRINGENS) in SOWS, in super intensive farm situation. This farm has an historic problem of deaths due to this cause.

The actions of the components in ANDCID PERFECT, is well described in the bibliography, and also in the European Union legislation, but we wanted to test at farm level.

This trial was done in Spain.

We want to thank you to all the people involved in this trial.

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TRIAL PROTOCOL

ANIMALS:

A total of 200 sows were split in 2 randomized groups of 100 animals:

- Group ANDCID PERFECT
- Group Negative control

They were located in exact conditions of light, feeding system, water system and environmental conditions. All the animals were individually identified.

FEEDING:

The standard feed in gestation and lactation diets.

The feed given to animals was:

- Group ANDCID PERFECT: normal feed + 2 kg/ton of ANDCID PERFECT
- Group Negative control: normal feed and no additive.

CONTROLS:

Each sow dead was determined if the dead was caused by Clostridium attending to the necropsias done to each dead sow.

RESULTS:

Results of the trial are shown in Table 1.

| SOWS | Group and ANDCID PERFECT | Group Negative Control |
|--|---------------------------------|-------------------------------|
| Total mortality in a year | 7% | 11% |
| Mortality due to Clostridium | 1,5% | 6,0% |
| Mortality due to different causes | 5,5% | 5,0% |

Table 1.

CONCLUSION:

ANDCID PEFFECT is an interesting tool to control sudden deaths caused by Clostridium perfringens in sows.



PART 2: Digestive problems in piglets

Target:

Now that we have many piglets coming from sows that were fed ANDCID PERFECT, and also piglets that are from sows that were feed without additives, we wanted to test if there were differences in the intestinal health of the animals, and the intestinal diseases.

To review the use of ANDCID PERFECT (synergic mixture of substances proved to improve the intestinal health, with coated sodium butyrate, formic acid and FOS, and special absorbent substances) to control indirectly the digestive problems in piglets (using ANDCID PERFECT in the mother sows), in super intensive farm situation.

The actions of the components in ANDCID PERFECT, is well described in the bibliography, and also in the European Union legislation, but we wanted to test at farm level.

This trial was done in Spain.

We want to thank you to all the people involved in this trial.

TRIAL PROTOCOL

ANIMALS:

A total of 400 piglets were in the trial.

- 200 coming from the sows that have eaten ANDCID PERFECT in the Part 1 of the trial. = GROUP ANDCID PERFECT
- 200 coming from sows that didn't eat ANDCID PERFECT in the part 1 of the trial. = GROUP NEGATIVE CONTROL

They were located in exact conditions of light, feeding system, water system and environmental conditions.

FEEDING:

The standard feed in farrowing crates, and after weaning (prestarter and starter diets)

CONTROLS:

- Weight of the animals at birth, weaning, and 9 weeks of age.
- Dead animals in all phases.
- Pens with diarrhoea.

RESULTS:

Results of the trial are shown in Table 2 & Table 3



| PIGLETS WITH THE SOW (IN THE FARROWING CRATE) | Group and ANDCID PERFECT | Group Negative Control |
|--|---------------------------------|-------------------------------|
| Average weight at birth | 1,35 kg | 1,30 kg |
| Average weight at weaning (22 days) | 6,25 kg | 6,10 kg |
| Mortality due to different causes | 12% | 15% |
| Pens with diarrhoea | 0% | 30% |

Table 2.

| PIGLETS AFTER WEANING | Group and ANDCID PERFECT | Group Negative Control |
|--|---------------------------------|-------------------------------|
| Average weight AT 9 WEEKS of age | 22,65 kg | 22,10 kg |
| Mortality due to different causes | 3% | 3,5% |
| Pens with diarrhoea | 0% | 20% |

Table 3

CONCLUSION:

ANDCID PEFFECT is an interesting tool to control digestive problems and to help pigs to grow more when feed to sows.