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URGENT NEWS

No 159: Improve the Quality of Drinking Water by Acidification

Improve the quality of drinking water by acidification:

What are the benefits and options?

Summary

Drinking water can be the ideal breeding ground for bacteria, yeasts and moulds which can block water lines and more seriously, be ingested by the animal, potentially causing pathogenic infections. Water acidification is an extremely effective solution to improve water quality/hygiene and reduce microbial activity, whilst also maintaining optimal animal performance and supporting a healthy gut flora. This can be achieved with the addition of Selko-pH or Selko 4 Health into the water supply which are both formulated to include a synergistic blend of buffered organic acids.

Why are buffered organic acids important for water acidification?

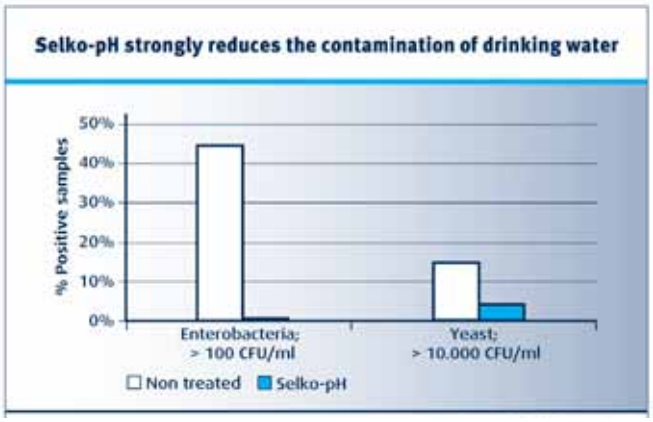
The use of a product combining buffered organic acids is a fundamental step towards creating optimal gut health in monogastric animals. Buffered acids are safer to handle and their dosage is flexible as the pH-level of acidified water when Selko-pH or Selko 4 Health are used will not fall below pH 3.4. A pH value below 4.0 is optimal as this will completely inhibit the growth of Enterobacteriaceae, whilst most importantly maintaining the safety and palatability of the drinking water. Application through the water supply ensures the effective delivery of organic acids throughout the entire gastro intestinal tract, reducing the number of Enterobacteriaceae in the small intestine.

Additionally it maintains the level of 'good' bacteria in the small intestines, such as Lactobacilli. In contrast, if a non buffered acidifier is used, the pH of the water will continue to decrease when inclusion levels increase. This will restrict the realistic dosage level and consequently will reduce the anti-microbial effect at intestinal level. It is also likely to affect palatability of the water which in turn will ultimately affect feed consumption and animal performance. Thus it is crucial that water is acidified in the correct manner to avoid such pitfalls.

Prevent biofilm build up

The growth of yeasts and moulds in water lines can result in biofilm build up, which can cause blockages in the pipes and drinking nipples.

Figure 1: The effect of Selko pH on the number of Enterobacteriaceae and yeasts in drinking water.



Selko, 2010

Research from Selko has shown that nearly 40% of untreated water samples have Enterobacteriaceae levels higher than 100 CFU / ml (Figure 1). At these levels blockages in pipes can occur. Comparatively, acidified water samples revealed a zero Enterobacteriaceae count.

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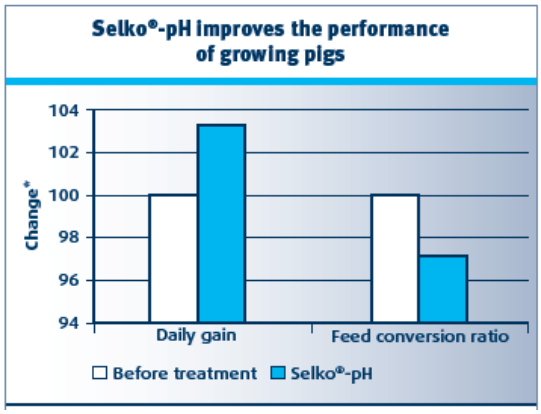
What are the solutions to effectively acidify drinking water?

Depending on the bacterial challenge and whether the aim is to reduce gram negative bacteria only or both gram negative and positive bacteria, two options are available:

1. Selko pH to reduce gram negative bacteria

Selko-pH is a synergistic blend of buffered short chain fatty acids (SCFA) including their ammonium salts. Ammonium salts are specifically used instead of sodium or potassium salts because of their ability to release H+, which increases their antimicrobial effect. SCFA are particularly effective at reducing levels of gram negative bacteria (e.g. E.coli and Salmonella sp.), both in the drinking water and the gastro intestinal tract of monogastric animals. Selko pH is added to the drinking water to reduce the pH (no lower than 3.4) as well as reducing the buffering capacity of the feed in the stomach which improves digestion.

Figure 2: Selko-pH was dosed at 2.0 L / 1000 L water from day 1 of the growing phase until slaughter on a commercial pig farm (40,000 pigs)



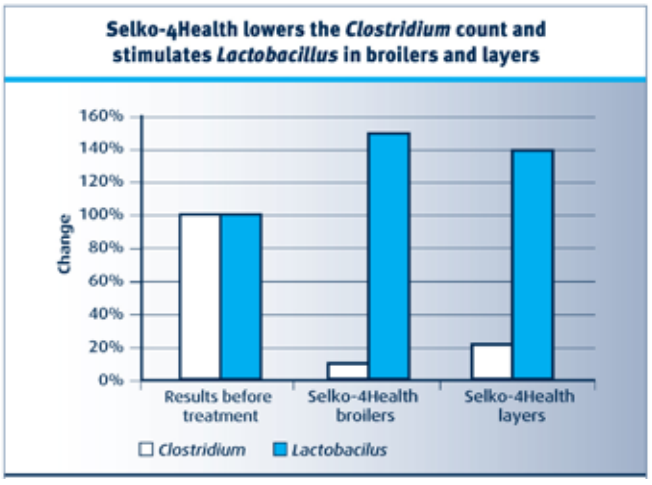
Selko, 2011

Overall, the growth performance of pigs was improved when Selko pH was added to the drinking water at a dose of 2 L / 1000 L water. Absolute improvement for daily gain was 26 g / day and FCR reduced by 0.08 (Figure 2).

2. Selko 4 Health to reduce both gram negative and gram positive bacteria levels

Like Selko-pH, Selko 4 Health contains a synergistic blend of buffered SCFA but additionally contains the added benefit of a high percentage of medium chain fatty acids (MCFA). Unlike SCFA, MCFA effectively kill gram positive bacteria (e.g. Staphylococcus, Streptococcus and clostridia). Thus the combination of SCFA and MCFA in Selko 4 Health provides a highly effective solution for targeting a broad spectrum of pathogens.

Figure 3: Selko 4 Health was dosed at 1 L / 1000 L water in both broilers and laying hens to determine the levels of Clostridium and Lactobacillus in litter samples.



Commercial Trials, 2010

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Results before starting Selko 4 Health treatment were set at 100% for both Clostridia and Lactobacilli counts in litter samples. Litter samples were taken from 70 broiler chickens and 68 laying hens. Clostridium reduction in manure for broilers and layers was 1.7 and 1.3 log, respectively, whilst lactobacilli levels improved indicating a healthy gut flora (Figure 3).

Recommendations:

Selko pH and Selko 4 Health can be used continuously as a preventative measure against pathogenic bacterial infections and to maintain clean/hygienic drinking water. The aim is to achieve a reduction in overall therapeutic antibiotic usage. Alternatively, use of Selko pH and Selko 4 Health can be targeted to specific situations, for example, during a bacterial challenge or during a period of stress such as a change of diet or environment.

Dosage levels:

	Selko-pH / 1000 L	Selko 4 Health / 1000 L
Piglets	1.5 to 2 L	1.0 to 1.5 L
Fattening Pigs	1.5 to 2 L	1.0 L
Sows	1.5 to 2 L	1.0 L
Broilers	1.5 to 2 L	0.5 L
Layers	1.5 to 2 L	0.7 L
Turkeys	1.5 to 2 L	0.7 L

Prior to use, we recommend the water is analysed to determine the mineral content and initial pH. This can be carried out at the FWTNI laboratory. From this information we can then advise the most effective dosage plan for each individual situation.

Further information can be obtained from the Frank Wright Trouw technical department on 01335 341102. Receive these technical publications directly via e-mail link. Contact Sarah Brandrick to register your interest on 01335 341128 or at sarah.brandrick@frankwright.com. You can also access this and past CONTACT and URGENT NEWS publications by registering on our website: www.frankwrighttrouw.com

Selko FEED ADDITIVES

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