Why Acidify?
The science behind livestock & poultry water acidification

Water is the most essential element for livestock and poultry production and is required more than any other nutrient. Inadequate intake of water will have a negative effect on feed intake and animal performance.

Much of the water in Canada is very alkaline, containing high pH levels ranging from 7.5 to 8.5. Water with elevated pH levels tend to contain high levels of minerals, particularly calcium and magnesium. Difficulties in dealing with high pH water include the build-up of lime scale in pipelines resulting in leaky nipples, reduced effectiveness of antibiotics, the reduced availability of chlorine and other sanitizing agents. The addition of acids to water and the subsequent reduction in pH can provide overall water quality improvements while enhancing performance and health for livestock and poultry.

The addition of acids to feed and water in poultry and livestock is not a new concept. The acidification of swine diets has been researched over the last 25 years as a means of improving health and performance in weaned pigs. Water acidification with the addition of lactic acid was studied in the late 1960's for improved growth and feed efficiency in nursery pigs. The poultry industry has focused on water acidification as a means of reducing the growth of pathogenic bacteria, particularly Salmonella. Generally, research has shown that combinations of acids will out perform single acids. The benefit arises from the synergy achieved by combining acids. The enhanced spectrum of activity makes them more effective at killing bacteria and reducing water pH. There are 2 main types of acids used to reduce water pH, inorganic and organic acids. Inorganic acids are very efficient at reducing water pH and are very cost effective. Comparatively the organic acids are much more bactericidal in nature - that is they have the ability to kill bacteria in a similar fashion to antibiotics.

There are a number of mechanisms of action for the addition of acids to livestock and poultry water systems.

1. Lowering the GI tract pH and increasing the activity of GI tract digestive enzymes.
2. Lowering GI tract pH will help reduce the growth of pathogenic bacteria.
3. Improvements in the utilization of oral antibiotic.
4. Prevent the build-up of lime scale in waterlines.
5. Improve the availability of chlorine.

pH Ranges for Growth of Pathogentic Bacteria

ORGANISM	MINUMUM PH	OPTIMUM PH	MAXIMUM PH
Clostridium perfringens	------	6.0-7.68	0.5
Eschericha coli	4.3 – 4.46	0 – 7.69	0 – 10.0
Pseudomonus aeruginosa	4.4 – 5.6	6.0 – 8.09	0 – 10.0
Salmonella sp.4	0.5 – 5.06	0 – 7.58	0 – 9.6
Staphlyococcus4	0.2	6.8 – 7.59	0.3

Approximate pH ranges for Bacterial Growth, Banmart, 1981