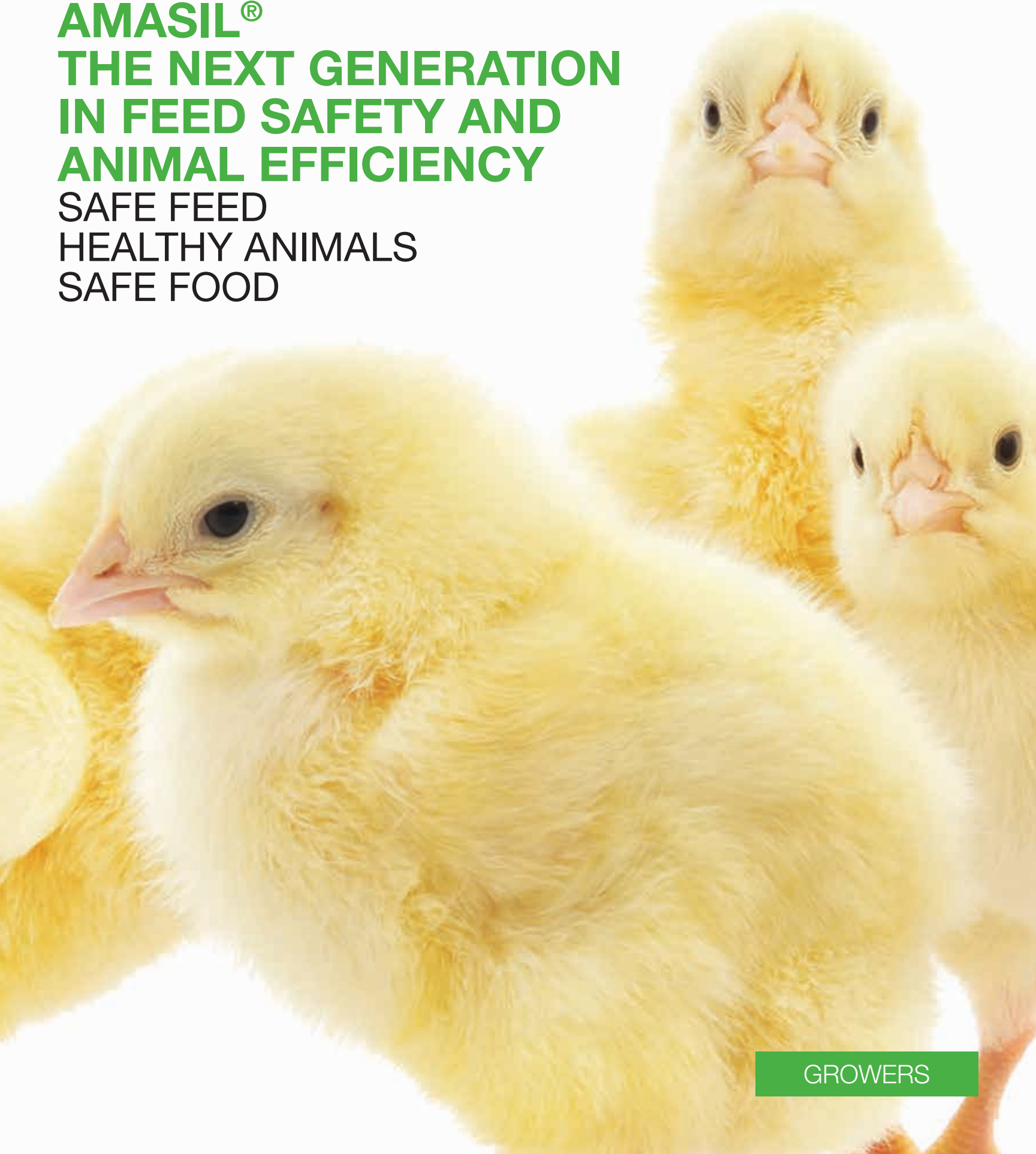




We create chemistry

# AMASIL® THE NEXT GENERATION IN FEED SAFETY AND ANIMAL EFFICIENCY

SAFE FEED  
HEALTHY ANIMALS  
SAFE FOOD



GROWERS

# AMASIL<sup>®</sup>

Formic Acid  
High Potency  
for Animal  
Efficiency

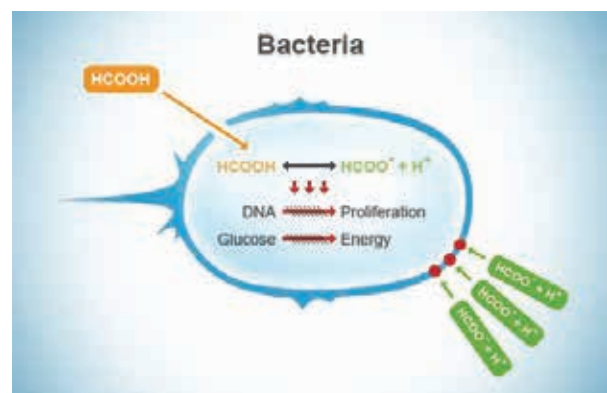
Amasil<sup>®</sup> formic acid is now available in the United States. This new feed acidifier improves feed hygiene and modifies gut microflora for improved feed efficiency and animal performance. Backed by 25 years of university and on-farm research, Amasil is used in swine diets around the world.

## WHY AMASIL<sup>®</sup> WORKS

Amasil is one of the strongest organic acids with the highest molecular density, allowing it to have a more complete and sustained antimicrobial effect in the feed and in the gut. Formic acid offers a low pKa and a low molecular weight. The low pKa means that more of the acid exists in the dissociated state in aqueous solution. The low molecular weight means that more individual formic acid molecules are present per gram of product. Together these features result in an organic acid with best-in-class performance.

## Strongest Organic Acid

ACID	pKa*	g/mol	Mol/kg
Formic	3.75	46	21.7
Acetic	4.75	60	16.7
Propionic	4.87	74	13.5
Lactic	3.86	90	11.1
Benzoic	4.19	122	8.2
Ascorbic	4.1	176	5.7
Citric	3.08	192	5.2



- Dissociated acid molecules, which cannot penetrate the cell membrane, reduce the pH of the extracellular environment and cause damage to the cell membrane.
- Undissociated organic acid molecules, which can enter into the microbial cell, inhibit microbial enzymatic processes and damage DNA.

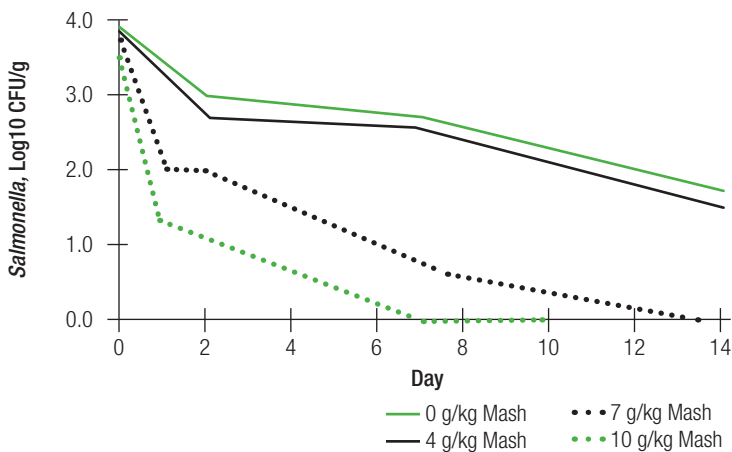


## SAFE FEED

Contaminated feed is known to facilitate the transmission of various pathogens onto the farm (Li et al., 2012). Many have tried higher pelleting temperatures to improve feed hygiene, yet this method is limited in its ability to protect against recontamination.

Amasil® formic acid is one of the most potent organic acids for killing feed microbial contaminants such as *Salmonella*, *E. coli*, *Clostridia*, and *Campylobacter* (Strauss and Hayler, 2001; Navarro et al, 2015). Also, feed acidified with formic acid maintains a lower pH longer, decontaminating feed and protecting against pathogen recontamination. Amasil reduces feed pathogen load and keeps it low longer.

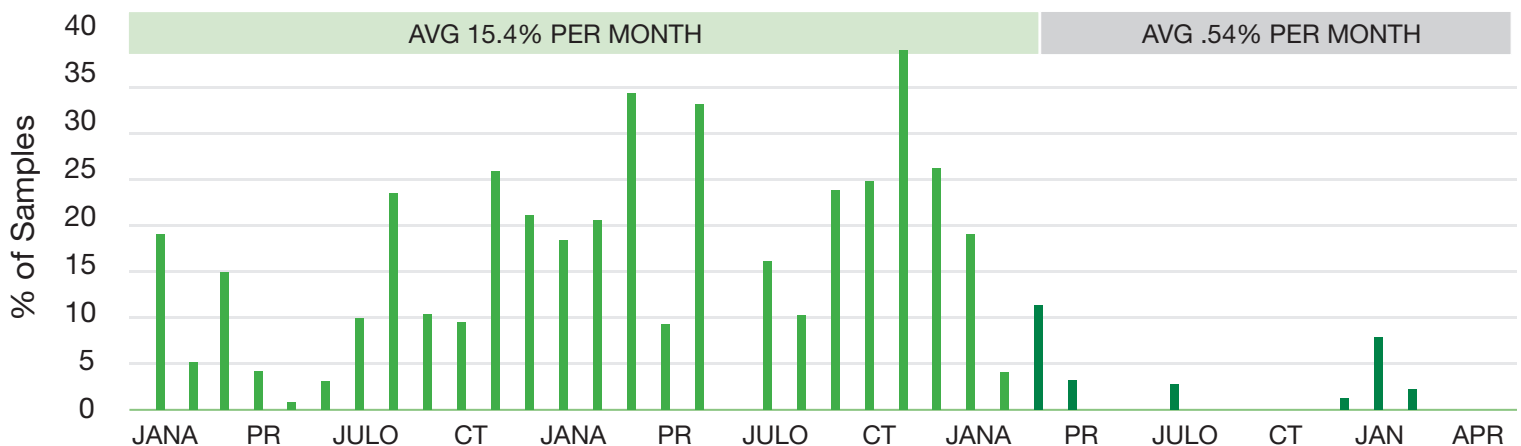
FIGURE 1  
Feed Decontamination



## HEALTHY ANIMALS

Acidification of feed with Amasil can result in lower prevalence of problematic microbial pathogens, and thus reduce their transmission. For example, acidification of breeder feed has been shown to reduce vertical transmission – under commercial conditions – from the breeders to the eggs (Humphrey and Lanning, 1988). This in turn can lead to reduced mortality and severity due to feedborne pathogens.

FIGURE 2  
*Salmonella* Positive Hatchery Waste



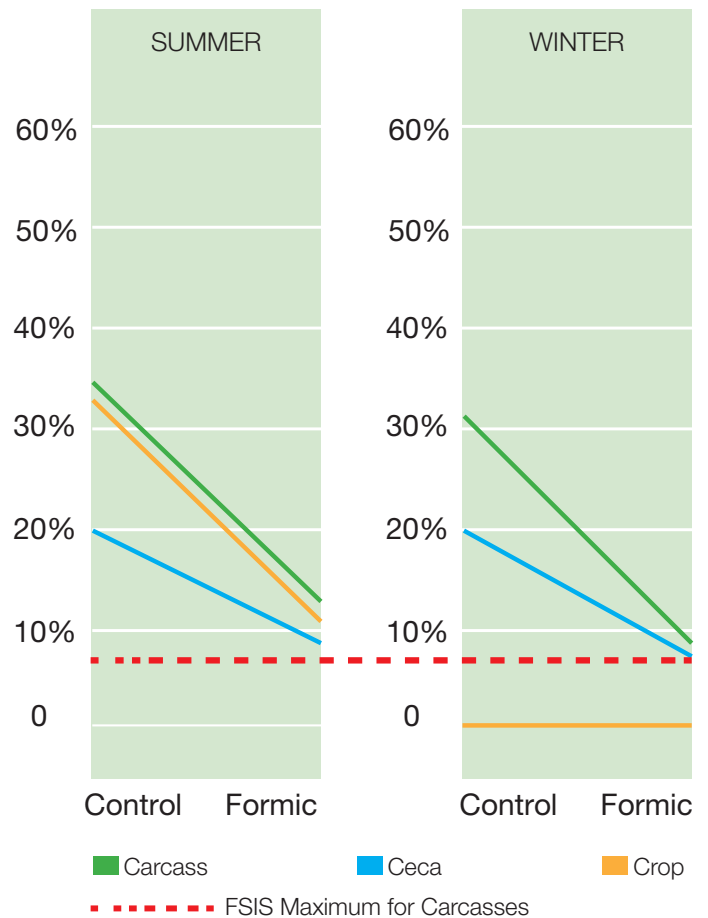
Adapted from Humphrey and Lanning, 1988

## SAFE FOOD

Consumer demand for high quality, wholesome food continues to increase, as does their desire for more transparency in knowing how their food is produced. While poultry producers continue to work hard to deliver on these needs, there are many opportunities for those willing to employ creative solutions to exceed these ever-increasing expectations.

Amasil formic acid offers a new and effective way to satisfy your toughest customer. Amasil formic acid can be an important part of your biosecurity plan.

FIGURE 3  
*Salmonella* Prevalence on Carcass



Adapted from Abdulla et al., 2012



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### Contact

BASF Animal Nutrition  
100 Park Avenue  
Florham Park, NJ 07932

Visit us online at  
<http://basf.com/amasil>