The challenges of working with highly aggressive chemicals

The overuse of antibiotics and the resulting increase in antimicrobial resistance on farms has become one of the biggest threats to human health. Over the last few years, consumers have begun to push back on meat and dairy products that are treated with antibiotics.

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Additionally, the US Food and Drug Administration (FDA) recently introduced a new regulation that requires a prescription from a veterinary feed directive (VFD) to administer antibiotics in feed and water. To ensure their livestock remains healthy, farmers have begun replacing antibiotics for growth purposes with highly aggressive chemicals (HACs), such as organic acids.

As different chemicals are introduced to the farm, new threats arise. Farming equipment that previously dispensed and diluted medications and vaccinations may not be designed to handle new chemistries, leading to malfunctions and biofilm build-up which could spread diseases on the farm. To phase out antibiotic use and begin using HACs safely, farmers should understand the benefits and challenges of working with new chemicals.

The benefits of HACs

HACs, specifically organic acids, deliver efficacy and safety, address specific feeding requirements and can even protect against reactivated salmonella.

In fact, a recently published study found that organic acid treatments for drinking water significantly reduced salmonella contamination in chickens.

Organic acids and HACs are not new to farms. They have been used in poultry diets for decades, eliciting a positive response in growth performance, while decreasing pathogenic bacteria. Adding organic acids to drinking water reduces the level of pathogens in water, regulates gut microflora and increases digestion of feed to improve growth performance.

Unlike antibiotics, organic acids do not contribute to antimicrobial resistance. While there is no perfect 'one chemical fits all' for farms and farming applications, there are several different types, such as lactic, formic, citric and fatty acids, that can be used to keep animals healthy, enhance growth and ultimately benefit both the farm's success and the health of consumers.

The challenges of HACs

In order for HACs and other chemicals to be as effective as antibiotics and kill dangerous micro-organisms, they need to be potent. However, the more powerful and effective these chemicals are at destroying micro-organisms, the more of a threat they pose to equipment that has been used on farms for decades.

Much of the equipment used to dispense and dilute chemicals on farms was originally designed to handle specific medications and vaccinations, but not necessarily equipped to adapt to harsh chemistries like organic acids.

As equipment is repurposed and relied upon to handle different chemicals, compatibility becomes an issue.

Older equipment may not have undergone laboratory testing with diluted and concentrated chemicals, from soaking seals, plastics, metals and more.

Without proper testing, there is no way for farmers to know if a new chemistry will work with current equipment. If the equipment is not compatible, the use of HACs could cause issues, such as biofilm build-up in water lines, attracting diseases like E. coli and bordetella.

Whether farming equipment is being used to create cleaning sprays or foams, sanitise water lines or distribute chemicals to improve gut health, there is a wide range of chemicals for each application. And if equipment can not handle multiple chemicals, the profitability of the farm may be in danger.

Finding the right fit

Selecting the right equipment is key to productivity and profitability on the farm.

It is essential to utilise equipment that has been tested and approved to work with a wide range of chemicals. Farming equipment that is in use but has not undergone laboratory testing should be replaced.

The right equipment should be:

- **Compatible:**
Your dispensers and water-driven pumps (WDPs) should be compatible with different types and combinations of HACs. Most farms do not use just one type of chemical to keep animals healthy, so it is essential to find equipment that has been tested with multiple HACs and can be used with any additional chemicals needed. Steer clear of equipment that is not compatible with HACs, or can not handle chemical adjustments as livestock grows.

- **Reliable:**
Although new chemicals and regulations are introduced regularly, dispensing and sanitising equipment should be ready for any challenge. Seek out dispensers and WDPs that do not just work for you now, but will work with you for years to come by adapting to future needs.

- **Precise:**
Sanitising and de-scaling water lines is crucial to keeping dangerous bacteria from infecting animals. Similarly, administering the right amount of medication or vaccination is essential to animal growth and profitability. Look for equipment that regulates water pressure to control and eliminate dilution variance, as well as adjusts ratios for organic acids, vitamins, medications and probiotics.

- **Advanced:**
Look for equipment that features advancements to enhance the overall safety and productivity of the farm. For example, today's WDPs can feature enhanced modulatory and a large injection range, ideal for farms that use multiple chemicals on a daily basis. Additionally, dispensers often include water pressure regulation technology, eliminating dilution variance so there is no wasted chemical or danger to animals.

- **Easy to install and maintain:**
Finding equipment that is easy to install and maintain saves you time and reduces costs. To keep equipment working best, make sure to routinely check for and address any issues.

Healthy farming with HACs

As farming evolves, technology must as well. To protect the health of animals, and the consumers who eat animal products, farms must take biosecurity measures to limit disease and ensure all equipment is compatible with HACs. With the proper dispensing, spraying and injecting equipment, farms can improve their productivity and the bottom line, and reap the benefits of HACs for years to come. ■

Hydro Systems' AquaBlend Xtreme is a water-driven pump compatible with highly aggressive chemicals used to treat or medicate water lines.