

Committed to Innovation

As exciting as recent developments in oral vaccination technology have been, Boehringer Ingelheim believes that the road to innovation lies with persistence and dedicated focus. Boehringer Ingelheim is committed to the research and development of innovative management tools for the purpose of supporting swine producers. No other company can match its worldwide resources, expertise and commitment devoted to swine production.

Since 1954, Boehringer Ingelheim Animal Health has contributed to an adequate supply of safe, nutritious food and is promoting the emotional and physical benefits arising from the human-animal bond. It will continue that mission to reduce the dependency on antimicrobials and develop products that add value and are worker- and animal-friendly.



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Vaccination Redefined

ORAL VACCINATION OF PIGS



Enterisol® Ileitis
Enterisol® SC-54
Ingelvac® ERY-ALC



Boehringer
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Producers find it pays to protect

WHEN IT COMES TO HERD HEALTH, IT IS BETTER TO BE PROACTIVE THAN REACTIVE.

PORK PRODUCERS UNDERSTAND THAT IT IS FAR MORE EFFECTIVE AND ECONOMICAL TO PREVENT DISEASE BY VACCINATING PIGS THAN TO USE ANTIBIOTICS. The challenge has been to administer vaccine economically, efficiently and consistently, without the accompanying labor expenses and impact on carcass quality.

Innovative technology from Boehringer Ingelheim Vetmedica, Inc. has changed the equation in favor of the producer. Research shows that administering vaccines orally, through drinking water, provides excellent disease protection while eliminating the problems associated with injections.

Oral vaccination offers numerous benefits:

- Mucosal and systemic immunity
- Convenience
- Efficiency in treating hundreds, even thousands, of pigs
- Reduced labor expenses
- No needles or potential to reduce meat quality
- Worker safety
- Compliance with Pork Quality Assurance (PQA) guidelines





Positive Approach to Stewardship

Pork producers follow sound production practices for many reasons, from economics to public health. Producers also realize that looking out for animal welfare and worker safety is simply the right thing to do.

Oral vaccination promotes a positive approach to stewardship by helping producers comply with key PQA principles:

- Establish and implement an efficient and effective herd health management program
- Provide proper swine care

Oral vaccination enables producers to prevent many diseases before they occur, reducing the need to feed antibiotics. That makes it a valuable component of — but not a substitute for — an overall management program that includes proper sanitation and nutrition. Remember, not even the best vaccine can consistently protect pigs whose immune systems are weakened by environmental stress or inadequate nutrition.

Oral Vaccination: It All Adds Up

The more pork producers adopt oral vaccination as a standard practice, the more benefits — tangible and intangible — are achieved. The return on investment already is impressive:

- **Economics.** Enterisol® Ileitis, in five large-scale field trials involving more than 120,000 pigs, provided a 5-to-1 return on investment. Other products in the portfolio have posted similar returns.
- **Management.** Oral vaccination allows producers to be proactive. By managing herd health on the front end, they don't have to play catch-up on the back end.
- **Improved quality.** Most vaccines are injected intramuscularly or subcutaneously, resulting in tissue lesions and economic loss due to carcass trimming at the packing plant. Oral vaccines increase meat quality by reducing the use of needles.
- **Worker safety.** Oral vaccination through drinking water saves labor as well as the risk of working with needles.

Add it all up, and oral vaccination just makes sense. For more information, please speak with your veterinarian or log on to www.bi-vetmedica.com.

Boehringer Ingelheim leads the way

OVER 20 YEARS AGO, BOEHRINGER INGELHEIM UNDERSTOOD THE PROMISE OF ORAL VACCINATION AND HAS DEDICATED VAST RESOURCES TO PRODUCING HIGH-PERFORMANCE VACCINES THAT CAN BE ADMINISTERED THROUGH DRINKING WATER. THE COMPANY OFFERS AN UNMATCHED PORTFOLIO OF ORAL VACCINES, ALL OF WHICH EXCEED STRINGENT USDA STANDARDS.

Enterisol® Ileitis

Enterisol Ileitis has quickly become the industry standard for prevention of porcine proliferative enteropathy (ileitis) caused by *Lawsonia intracellularis*. It is approved for vaccination of healthy, susceptible pigs three weeks of age or older. It provides numerous advantages for pork producers:

- The first USDA-licensed, one-dose oral-administered ileitis vaccine
- Ileitis management with immunity instead of continuous use of antibiotics
- Reduced exposure to needles, resulting in improved pork quality and worker safety
- High return on investment demonstrated to be 5-to-1

Enterisol® SC-54

Enterisol® SC-54 is recommended for use in healthy, susceptible pigs one day of age or older, to protect against both *Salmonella choleraesuis* and *Salmonella typhimurium*. It is the only salmonella vaccine that does not contain the virulence plasmid (disease-causing gene), as well as the only vaccine proven to reduce salmonella both in the live animal and at harvest. This pays back producers in several ways:

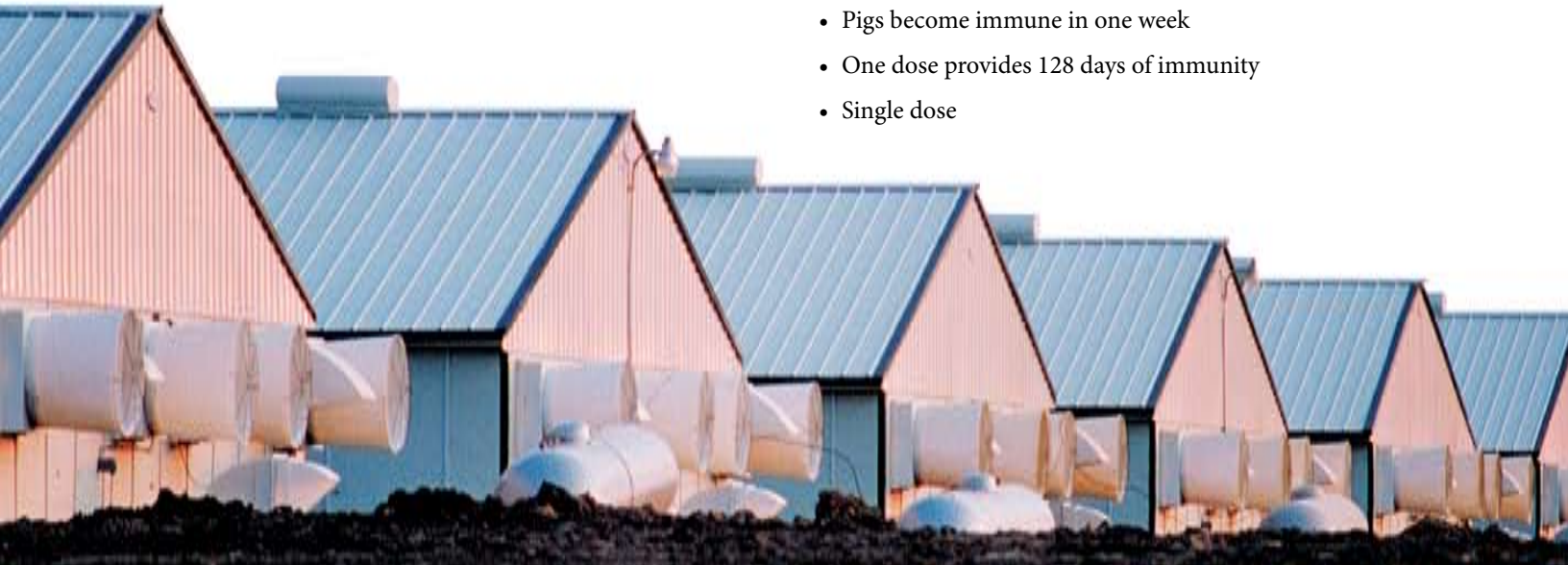
- The fastest onset of immunity (14 days)
- The longest duration of immunity (at least 140 days)
- Increased food safety

Ingelvac® ERY-ALC

Ingelvac® ERY-ALC is the only one-dose oral *Erysipelothrix rhusiopathiae* vaccine. It is recommended for use on healthy, susceptible pigs eight weeks of age or older to prevent disease caused by erysipelas.

It provides benefits unmatched by other vaccines:

- Pigs become immune in one week
- One dose provides 128 days of immunity
- Single dose





Simultaneous Use of Oral Vaccines

The United States Department of Agriculture (USDA) has approved the simultaneous use of Enterisol® Ileitis FF, Enterisol® SC-54 FF and Ingelvac® ERY-ALC vaccines. Now all three oral vaccines may be used at the same time, when administered through drinking water.

This new application of oral vaccine technology allows producers to save the time and labor expenses associated with traditional, injectable vaccinations. The use of simultaneous vaccination offers producers an additional reduction of time and labor expenses by consolidating the administration of three products.

The simultaneous use of Enterisol® Ileitis FF, Enterisol® SC-54 FF and Ingelvac® ERY-ALC oral vaccines offers several advantages that add to the bottom line:

- Reduction of labor expenses
- Reduction of management time
- Reduction of tissue damage in carcasses
- Elimination of risk associated with needles

When simultaneously administering three oral vaccines, always make sure that the timing of each individual vaccine is appropriate for the disease situation. Consult with your herd veterinarian or a BIVI Professional Services Veterinarian (1-800-325-9167) to determine the best timing for each vaccination.

Oral Vaccination Dos and Don'ts

Do

- Premeasure four-hour water needs
- Neutralize chlorine, and stop peroxide and citric acid
- Withhold certain antibiotic medications for at least three days before and after vaccination
- Check bins and waterers to ensure they are medication-free
- Bleed drinkers at the end of the water lines prior to vaccination so all pigs get a sufficient dose of vaccine
- Use Ready Pack™ DT or clean stock solution vessel
- Monitor vaccine usage

Don't

- Assume a diagnosis
- Withhold water prior to vaccination
- Reduce dosage
- Vaccinate unhealthy or stressed animals
- Retain partially used vaccine bottles

Proper vaccine administration is critical link to success

BOEHRINGER INGELHEIM IS CONFIDENT THAT ITS LINE OF ORAL VACCINES WILL PROVIDE UNMATCHED PERFORMANCE AND RETURN ON INVESTMENT WHEN THEY ARE ADMINISTERED ACCORDING TO LABEL DIRECTIONS. IT IS EQUALLY TRUE THAT THE BEST VACCINE IN THE WORLD MAY BE INEFFECTIVE IF IMPROPERLY HANDLED OR ADMINISTERED.

Even under the best conditions, population dynamics suggest it is unlikely that 100 percent of a vaccinated herd will develop immunity. Mistakes made during any part of the vaccine handling chain can decrease the percentage of a population that acquires protective immunity. Boehringer Ingelheim is committed to doing everything possible to provide effective vaccines from the lab to the farm, but producers also play a critical role. Here are a few pointers to keep in mind:

Sanitation. The same proportioner, stock solution container and plumbing manifold often are used for various vaccines, sanitizers and antibiotics. Flushing the proportioner with fresh water immediately preceding and following any vaccine delivery will help ensure vaccine viability. Use a dedicated stock solution vessel (e.g. Ready Packs) for vaccinations.

Timing. Vaccination timing is very important. Work with your veterinarian to determine when to vaccinate for each disease.

Don't withhold water. Some producers withhold drinking water for a period before beginning vaccination through the drinking water. However, this practice should be discouraged because of the stress of withholding water from pigs and the necessity of water as a nutrient.

Treat the water. Any agent with known or suspected activity against living cells should be neutralized or discontinued during vaccination, such as feed antibiotics, "on-farm" chlorination or other water-sanitizing treatments. Boehringer Ingelheim has convenient Ready Packs to neutralize chlorine.





The Mucosal Immunity Advantage

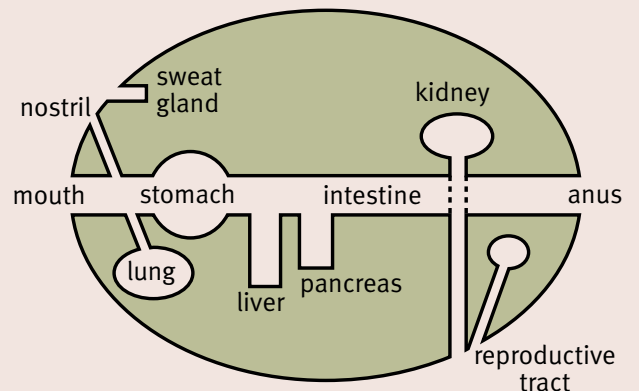
The economic benefits of oral vaccination alone make it the right choice for most pork producers. However, there also is ample scientific evidence demonstrating it is more effective than injectable vaccinations in preventing disease.

Immunologists call this process mucosal immunity, which can be defined as resistance to infection across the mucous membranes. Why is this so beneficial?

Most disease-causing organisms enter the pig through the mucosal surfaces of the respiratory tract, digestive tract or reproductive system. Therefore, providing a line of defense at disease entry points is preferred. Several studies have demonstrated that stimulating immunity via injection does not produce a mucosal response. On the other hand, stimulation of the mucosal immune response can result in production of protective B and T cells in both mucosal and systemic environments so that infections are stopped before they get into the body.^{1,2,3}

The challenge has been finding an efficient way to administer vaccines to these mucosal surfaces. Thanks to the development of effective oral vaccines, that problem has been solved.

Tyler Holck, DVM
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Boehringer Ingelheim Vetmedica, Inc.



SCHEMATIC DIAGRAM OF THE MUCOUS MEMBRANES OF THE BODY AND SURFACES WITH WHICH THEY ARE IN CONTACT.

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