



The Next Big Thing in *Salmonella* Control.

Food safety is a critically important task where the American consumer allows no margin for error. A single outbreak affects everyone's livelihood, along with the brand equity and trust that takes years to build. Because of the potentially extreme consequences, the responsibility of reducing risk can't be placed solely on the processing plants; it must be shared industry-wide.

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Food Safety

THE U.S. DEPARTMENT OF AGRICULTURE ESTIMATES
THAT **FOODBORNE ILLNESSES COST MORE THAN**

**\$15.6 BILLION
EACH YEAR¹**

Processing has traditionally been viewed as the last line of defense for safeguarding consumers from foodborne disease. But as an integrated company, your organization should make sure every person in the organization understands their role in helping the plant deliver the safest product possible.

This eBook is designed to explain the role vaccines play in helping reduce the amount of *Salmonella* contamination brought to the processing plant, which gives in-plant interventions a much greater chance of being effective.

The adoption of various types of *Salmonella* vaccines in your integrated poultry company can help reduce the load, thus ensuring that *Salmonella* control is a shared responsibility across the poultry production chain.

Comprehensive Food Safety Begins at the Farm.

Elanco Food Safety has more than a decade of experience working side by side with quality assurance and food safety teams. Together, we've developed pre-harvest intervention strategies that reduce the amount of *Salmonella* contamination brought to the processing plant, helping the food chain reduce the likelihood of foodborne illnesses.

We realize there is no silver-bullet solution to *Salmonella* control. Integrating *Salmonella* vaccines as part of a comprehensive food safety program can reduce the overall prevalence of *Salmonella* contamination of birds entering the plant, especially the higher-risk B and D serotypes.

CDC ESTIMATES THAT EVERY YEAR, MORE THAN

**400,000
PEOPLE IN THE U.S.**

ARE SICKENED WITH RESISTANT *SALMONELLA*
OR *CAMPYLOBACTER*.¹

"I think the biggest misconception is that processing can solve all pathogen challenges. What we need to do to make sure in-plant interventions have the best opportunity to work is to send the processing plant the lowest possible levels of Salmonella."



Dr. Bill Potter,
Elanco Food
Safety Advisor



What Are *Salmonella* Vaccines? The Next Big Thing in *Salmonella* Control.

Salmonella vaccines are widely used in the egg-laying industry and in broiler breeders to help prevent *Salmonella*; however, their use in broilers is not as widespread. Why? **There's a need to increase communication among processing decision-makers, influencers and live-side production to ensure all options are being fully considered.**

Vaccination programs are typically determined by the teams that will ultimately implement the program — live-side production and company veterinarians. **However, when it comes to food safety and controlling *Salmonella*, there is an opportunity to collaborate with a broader team. This is where you come in.**

Food safety, quality assurance and poultry processing professionals have an opportunity to influence the decision to use *Salmonella* vaccines as part of a comprehensive *Salmonella* control strategy, helping to reduce the amount of contamination brought to the processing plant and giving the in-plant interventions a much greater chance of being effective.

*“Salmonella vaccines complement in-plant interventions by helping to reduce the amount of contamination brought to the processing plant. This allows the in-plant interventions to have a much greater chance of being effective, resulting in lower *Salmonella* contamination on finished products.”*



Sandra Aehle,
Elanco Food
Safety Advisor

Salmonella Reduction Is a Shared Responsibility.

Poultry processing plants do a tremendous job as the last line of defense, but too much *Salmonella* can stress the effectiveness of in-plant interventions. Live-side solutions, such as *Salmonella* vaccines, can help reduce *Salmonella* loads earlier in the process, so the entire burden doesn't fall on in-plant interventions.

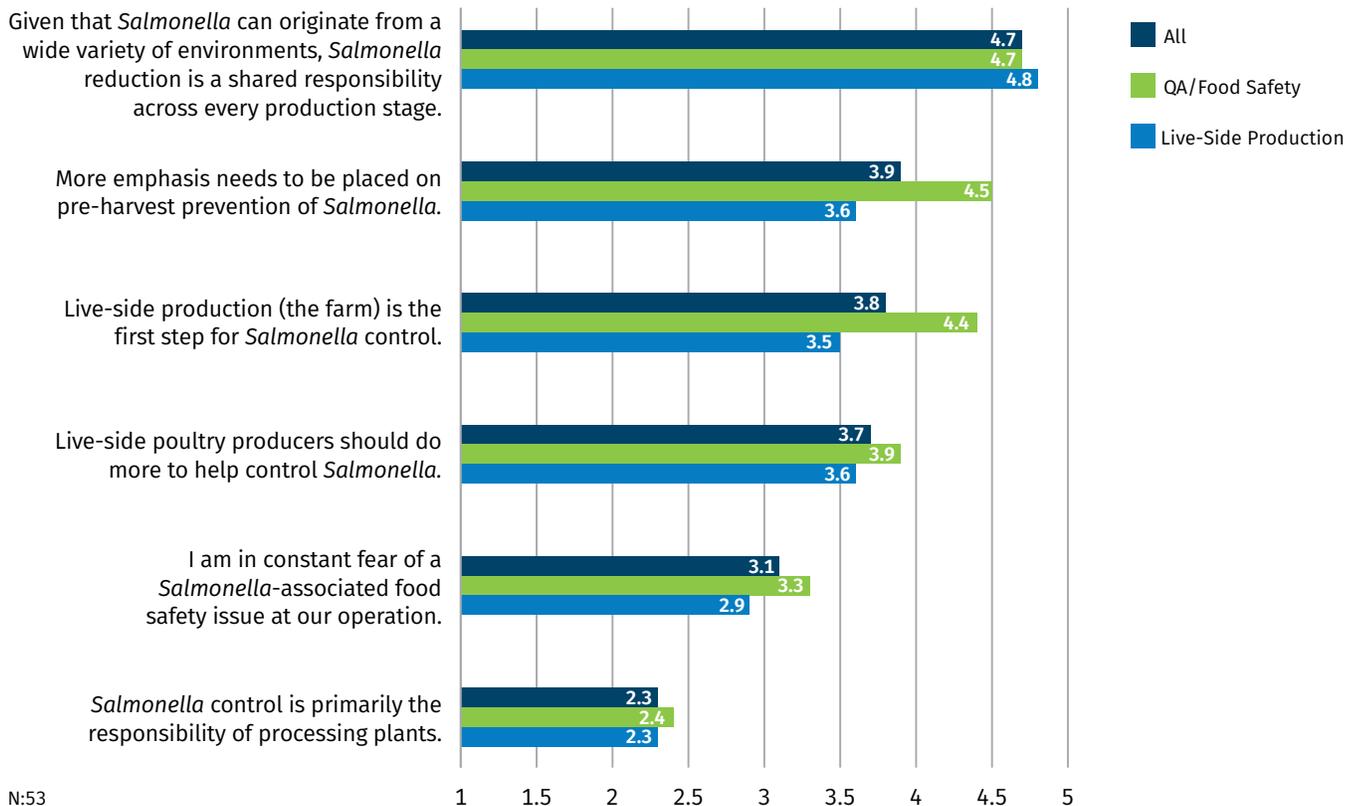
Elanco Food Safety fielded a blind industry survey with poultry quality assurance, food safety and live production professionals to outline the steps being taken to control *Salmonella* and identify who the poultry production chain believes is ultimately responsible for its control.

Live-Side Production: the First Step in Salmonella Control.

- All respondents agree that *Salmonella* reduction is a shared responsibility across every production stage.
- Respondents with QA/food safety roles completely agree that live-side production is the first step to *Salmonella* control and more emphasis needs to be placed on the pre-harvest prevention of *Salmonella*.
- Those in live-side production roles don't always see how they can play a part in food safety.

How much do you agree or disagree with the following statements?

(1 – completely disagree, 5 – completely agree)



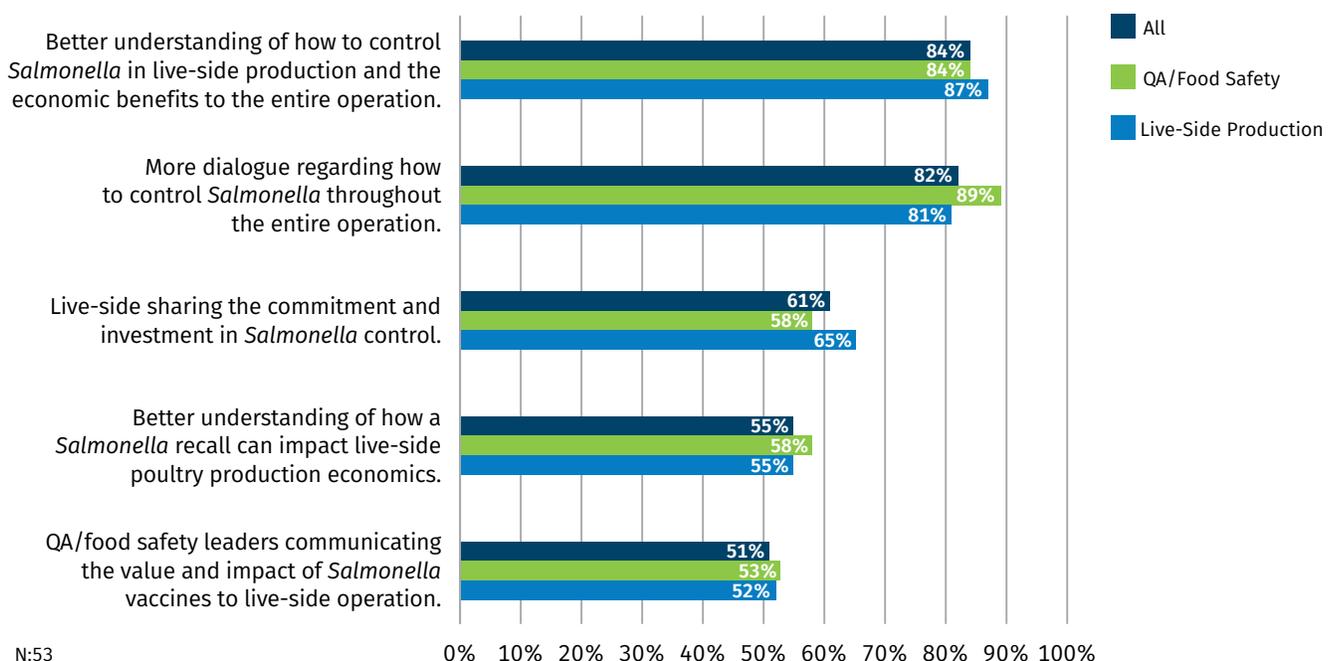


Live-Side Production Wants to Help Control *Salmonella*.

- Respondents agree that more dialogue is vitally important regarding how to control *Salmonella* throughout the poultry production chain.
- Those with QA/food safety roles feel more strongly about this statement than do their live-side production counterparts.
- 65% of live-side production respondents feel they should be sharing the commitment and investment in *Salmonella* control and feel they need to do more to help their QA/food safety counterparts control *Salmonella*.

In your view, how could live-side production and processing plants collaborate better, particularly to manage food safety?

(Check all that apply)



N:53



What Can I Do to Help?

Based on the research, industry counterparts in live-side production — veterinarians and production managers — are looking to quality assurance and food safety professionals to help provide insights on effective *Salmonella* control interventions.

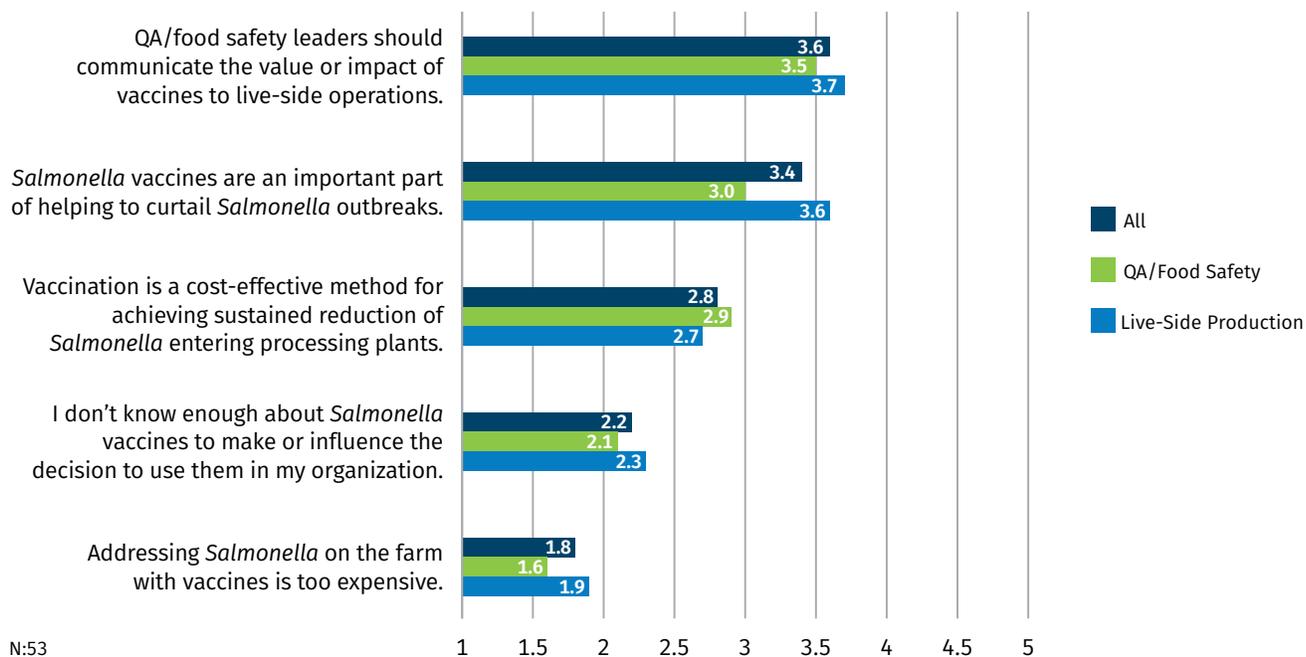
This creates an opportunity for quality assurance and food safety teams to lead a conversation regarding how *Salmonella* vaccines can help reduce the level of *Salmonella* contamination arriving at the processing facility.

Food Safety Can Lead the Conversation.

- Respondents agree that QA/food safety leaders should communicate the value or impact vaccines have on live-side operations.
- Those with live-side production roles feel more strongly about this than their QA/food safety counterparts.

How much do you agree or disagree with the following statements regarding *Salmonella* vaccines?

(1 — completely disagree, 5 — completely agree)



How Do *Salmonella* Vaccines Work?

The major obstacle to *Salmonella* control in the poultry industry is the ubiquitous presence of *Salmonella*. Poultry can be latent carriers, shedding and spreading *Salmonella*, especially when stressed. Preventing colonization as early and effectively as possible reduces shedding and the subsequent spread of *Salmonella*.

Salmonella vaccines use tiny doses of live or killed (inactivated) bacteria to stimulate protective immunity in the chickens. Inactivated and live vaccines can be used in the breeder birds (parent stock) and egg-laying hens, and live vaccines can also be used in meat birds (broilers and turkeys).

Live vaccines work by colonizing the bird's gut and competing with wild-type *Salmonella* strains, excluding those dangerous wild types from proliferating in the bird ("competitive exclusion").

In addition, the bird's crop is the first line of defense against *Salmonella* colonization of the intestinal tract. Some live *Salmonella* vaccines also aid in the reduction of *Salmonella* in the crops of chickens. By reducing *Salmonella* in the crop, before it reaches the intestine, *Salmonella* vaccines can further reduce the total load of *Salmonella* challenge facing broilers entering the processing facility.

"Salmonella vaccines parallel the natural infection path of Salmonella, triggering local, humoral and cell-mediated immune responses that are unique to live Salmonella vaccines. This protective immunity translates to reduced infections and shedding when birds encounter a field infection of wild-type Salmonella."



Brandon Carter,
Elanco Food
Safety Advisor

The Proof Is in the Results.

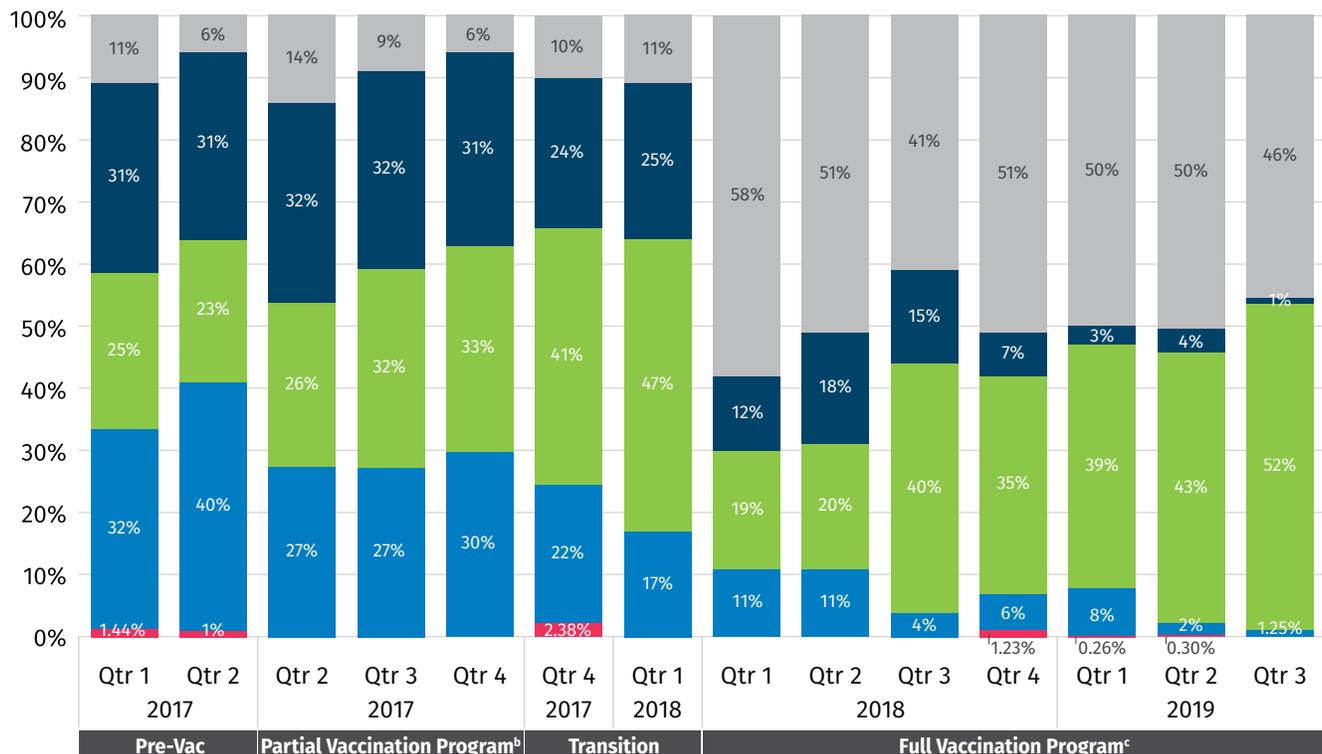
Salmonella vaccines have been proven to reduce the overall prevalence of *Salmonella* contamination of birds entering the processing facility, especially the high-risk *Salmonella* B and D serotypes.

These serotypes include Enteritidis, Heidelberg and other highly zoonotic *Salmonella* serotypes that can be difficult strains to manage with in-plant interventions due to their presence in the meat, bone marrow and muscle of the bird. In addition, these serotypes have been some of the major causes of foodborne illness in humans.

43%
REDUCTION²

Field research conducted by Elanco and its customers demonstrates that administering *Salmonella* vaccines to breeders and their progeny resulted in a 43% reduction in the overall prevalence of *Salmonella* in more than 3,800 hot rehang and part rinse samples during a two-year period.

Plant Samples^a: % Serotype Prevalence by Vaccination Period²



^a Rehang and part rinse combined

^b Vaccinated with Megan[®] Vac 1 in broilers, live ST vaccine in breeders

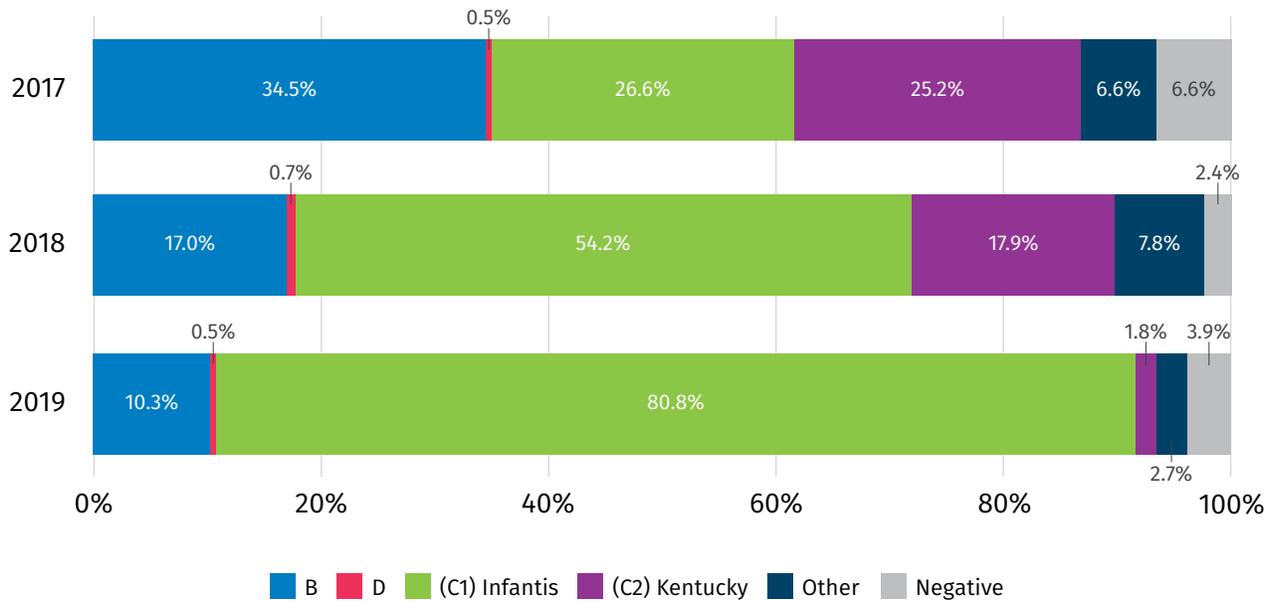
^c Vaccinated with full Megan program: Megan Vac 1 in broilers, Megan Egg in breeders

■ D ■ B ■ (C1) Infantis ■ Other ■ Negative

26.3% REDUCTION²

Field research has also revealed that administering *Salmonella* vaccines to breeders and their progeny significantly reduced the combined prevalence of serotypes B and D by 26.3% over a two-year period of tracking more than 3,800 hot rehang and part rinse samples.

Rehang Samples: % Serotype Prevalence²



The full vaccination program began in Q3 2017. The 2018/2019 data reflects the birds being on a full vaccination program.



Start the Conversation.

It takes the entire poultry industry working together to prevent a *Salmonella* outbreak and achieve FSIS *Salmonella* category 1 status. Food safety and quality assurance professionals can help lead the conversation, driving the adoption of live-side *Salmonella* interventions that help complement a plant's industry-leading efforts.

Salmonella vaccines are proven to help take pressure off in-plant interventions, lowering *Salmonella* loads before the birds reach the processing facility. Plus, using *Salmonella* vaccines ensures that everyone in the production chain is sharing responsibility for *Salmonella* control.

Elanco Food Safety has the resources to help start a discussion within your organization about reducing *Salmonella* loads in live birds. Elanco's team of food safety experts and veterinary consultants are ready to help you lead the conversation.



To learn how Elanco Food Safety can help you start a comprehensive *Salmonella* control conversation, [contact us](#). You can also visit [Working Together for Food Safety](#) and [Salmonella360](#) for more information.

¹ <https://www.cdc.gov/foodsafety/pdfs/CDC-Food-Safety-2018-H.pdf>

² Elanco Animal Health. Data on file.