



The aim of the zoonoses national control programme for Salmonella in pigs (ZNCpig) is to take action at every level in the chain from farm to fork to reduce the risk from Salmonella. This includes taking action on farm to reduce the risk of Salmonella circulating between pigs. Action plans for Salmonella should be part of the farm's health and welfare plan. Many of the actions required for the control of Salmonella will also help reduce the effects of other diseases on pigs.

## Taking Effective Action to Control Salmonella

<b>the good news</b>	Those things that work on-farm to reduce salmonella often come with added production benefits that can make a substantial positive difference to your bottom line. Many of the things you need to target to improve herd performance will help to control Salmonella.
<b>the bad news</b>	Some interventions might do nothing on your individual farm but cost you money.
<b>the crunch</b>	There is no single solution that is guaranteed to work for everyone so it's essential to get a clear focus on the big picture, weigh up the pros and cons of all your options and make the right decisions to protect your business.



### TARGETS

1. To get salmonella levels down and keep them down
2. To do it cost-effectively



### 5 KEY STEPS TO SUCCESS

1. Determine what you can do on your farm to better control salmonella and protect your business
2. Work out a cost effective plan for your farm
3. Put your plan into action
4. Commit 100% to following it through long enough to gain the benefits
5. Review and modify periodically to achieve even better results

#### Try this next time you receive your ZNCPigs report

- If you don't already, we suggest getting all the staff together whenever you get a ZNCPigs report. This could be just a few minutes at the start of a tea break to say, "Well done, everyone's doing a great job. Any thoughts on how we could be doing even better?"
- Or, where problems arise, schedule time for a more thorough discussion. It's essential to keep staff involved with what is happening and what else needs to be done.
- Where possible engage your staff and your vet in the problem-solving and decision-making process; their input will be invaluable and ownership of a decision makes implementation all the easier.
- Try using the ZNCPigs advisory notes to focus your discussions.

#### Put your ZNCPigs report to work

The arrival of your ZNCPigs report is a useful prompt to evaluate progress and review procedures. When reviewing, don't limit yourself to just salmonella-related information - taking a parallel look at production data and changes in farm protocols could reveal important trends you might otherwise miss.

#### DON'T BE OUTSMARTED BY SALMONELLA

What works for one may not work for all so the key is to choose your weapons wisely and use them properly. The critical factor, whatever you do, is to be methodical and persistent.

cleaning & disinfection      pest control      sourcing salmonella-free stock  
**cost effective solutions** > **less salmonella** > **healthier pigs** > **better feed efficiency** > **faster growth**  
 vaccination      organic acids in water and feed      feed formulation & liquid feeding

Your Goal

Reduce Salmonella on farm to below 10% for meat-juice Elisa

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## Ten steps to Salmonella control

The self-assessment questions below highlight key areas in which action can be taken to reduce the level of Salmonella on your farm. If the answer is 'No' to any of the self-assessment questions, the next question should be whether it is something that could be done to reduce Salmonella and other health risks.

### Step 1: Don't buy in Salmonella (and pay for it, as well!!)

One of the commonest ways of bringing Salmonella onto farms is through buying pigs that are carrying the infection. When that happens not only have you got the problem but you have paid for the privilege. Ask your supplier what tests have been done for Salmonella, when these tests were done and what the results were - remember you are the one who is paying! This will tell you whether the risk of introduction is high or low. The stress of transport increases the chance that pigs will be passing out Salmonella infection after they arrive. Keeping the pigs in quarantine away from other stock reduces the risk of spreading that Salmonella around your farm through pigs. Vaccination or using organic acids in feed or water for the first few weeks after arrival on the farm can further reduce the risk.

Do you ensure that all pigs bought-in come from one source (or as few sources as possible)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
If pigs are bought-in from different sources are they always kept as groups in different buildings?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you require vehicles bringing pigs to your unit to be well cleaned & disinfected before loading pigs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Commercial stock</b>		
Do you vaccinate pigs for Salmonella before or after they arrive on farm?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you plan to add organic acids to the feed or water for at least the first 3 weeks on farm.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<b>Breeding stock</b>		
Do you quarantine incoming breeding stock well away from other pigs on your farm.?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you vaccinate pigs for Salmonella before or after they arrive on farm?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you plan to add organic acids to feed or water for breeding stock while in quarantine?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 2: Keep Salmonella out - good biosecurity

Anything that comes onto your farm from outside can potentially bring salmonella on to the farm eg visitors, vehicles, machinery, bedding, feed. Think about how you can reduce the risk. Limiting vehicles and visitors to absolute essentials is a good start. All visitors should be supplied with clean overalls and boots and should wash their hands and use the foot baths provided. Check that farm supplies such as feed and bedding are low risk for introducing Salmonella.

Unit security - Is perimeter fence secure, are all gates locked and is there a "no entry" sign at entrance?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are vehicles kept out of unit	Pig transport, loading area	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Feed delivery	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Cars	Yes <input type="checkbox"/> No <input type="checkbox"/>
	Other	Yes <input type="checkbox"/> No <input type="checkbox"/>
Are all vehicles and machinery properly cleaned and disinfected before being allowed entry to the unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are visitors kept outside of the pig areas on the unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are visitors supplied with clean overalls and boots?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is there a footbath that is kept clean and topped-up regularly with disinfectant at the unit entrance?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you check that any bedding purchased is free of rodents and free of rodent and bird contamination?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Does all feed purchased meet the Codes of practice for the control of salmonella in feed for livestock?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 3: Stop animals birds and insects spreading Salmonella around your unit

Once Salmonella is on your farm pigs, people and pests will spread it around. They will also spread any other diseases that are on the farm. It is important to take steps to reduce the possibility of rodents and birds spreading infections.

During the past 7 days, have you seen any evidence of rodents where pigs are kept or in feed stores?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you have a rodent control plan?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are baiting stations checked regularly and bait renewed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are there enough baiting stations?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
During the past month, have you seen any evidence of birds where pigs are kept or in feed stores?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Have pig buildings, outdoor troughs/feeders and feed stores been bird and rodent proofed adequately?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
During the past month have any cats, dogs or other animals been where pigs are kept or in feed stores?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Have steps been taken to keep pets and other animals away from where pigs are kept and feedstores?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
During the past month have flies or other insects been a problem where pigs are kept or muck heaps?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is the unit generally tidy and are all rubbish and potential breeding sites for pests removed asap?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

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### Step 4: Stop people spreading Salmonella around your unit

It only takes a moment's thoughtlessness for someone to carry infection from one group of pigs to the next. For example, using the brush from the finisher house to clean out a pen of growers. Don't forget that people can give Salmonella to pigs.

Do all staff start every day with clean overalls?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do all staff start every day with thoroughly cleaned and disinfected boots?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are there different coloured overalls for staff working with different age groups of pigs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are staff rooms clean and tidy? Is there a staff toilet with a washbasin that works properly?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do staff wash their hands regularly with soap and water?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are staff instructed not to enter the unit if they have diarrhoea?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is there a clean foot dip with a disinfectant at the correct strength at entrances to all the buildings?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are there brushes for removing visible muck before dipping boots in disinfectant foot dips?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Does everyone use a brush for removing visible muck before dipping boots in disinfectant foot dips?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do staff who work with different ages of pigs always start with the youngest group?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 5: Break the cycle of Salmonella infection on your unit

When Salmonella or any other infection is circulating on your farm it is important to try and break the cycle of infection. The easiest way to do this is to get rid of all the pigs and then thoroughly clean and disinfect. If you can't do this for the whole site then the next best is to do it for a whole building (or rooms within a building). NEVER HOLD PIGS BACK. When moving sites outdoors it is important to consider C&D of arcs, trough and feeder design to minimise contamination by birds and vermin, vermin control on the old and new sites, especially good baiting of new straw ricks etc. Old farrowing beds and cosikennel beds/runs attract vermin and it should be standard practice to remove and dispose of these as soon as possible so that they don't become breeding sites.

Are all pigs removed from the unit before the next batch of pigs arrive (Strict All-IN All-OUT)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are all pigs removed from each house on the unit before the next batch of pigs are put in?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are all pigs removed from the rooms in each house on the unit before the next batch of pigs are put in?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
When outdoor pigs are moved to a new site are steps taken to minimise the risk of Salmonella transfer?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are old farrowing beds and cosikennel beds/runs removed and disposed of as soon as possible?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
If pigs become sick do you have dedicated sick pens?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are sick pens in a separate building and are sick pigs never returned to production pens after recovery?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do any sick pens drain into or through standard production pens?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are sick pens cleaned and disinfected between batches of pigs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is there separate colour-coded equipment eg shovels, brushes for each building on the unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is all machinery that moves between buildings cleaned and disinfected before moving?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are muck heaps and under-slat slurry stores completely removed or emptied between batches of pigs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are all cracks in walls and floors routinely filled in after removing batches from a building?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 6: Cleaning and disinfection to get rid of Salmonella

Cleaning and disinfection needs to be very good to get rid of Salmonella. Dirt stops most disinfectants from killing Salmonella. Surfaces, drinkers and feeders need to be really clean before using disinfectant as otherwise you are wasting time and money. Make sure you know how much disinfectant to add to get the right strength. Disinfectants need time to be effective - don't just bounce them off the walls with a pressure washer. DRYING OUT is the most important step!

Are all buildings soaked overnight or for at least 2 hours as soon as the pigs are removed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are detergents used to help remove all the dirt before disinfection?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is all movable equipment removed from buildings for thorough cleaning and disinfection?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you clean thoroughly underneath slats?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you check that all areas are properly cleaned before disinfection?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are buildings allowed to dry before applying disinfectants?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Have you checked whether the disinfectant you are using is effective against Salmonella?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is special attention paid to cleaning and disinfection of feeders and drinkers?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do staff know exactly how much disinfectant to add to get the right dilution rate?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you check that enough disinfectant is being applied - volume of water and of disinfectant used?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is disinfectant applied using a low pressure system eg knapsack sprayer so that it clings to surfaces?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are all buildings allowed to dry for at least one week between batches of pigs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

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### Step 7: Reducing Salmonella risk through the water supply

Salmonella can survive in the water supply from one batch to the next. Make sure header tanks are sealed and clean and disinfect the whole system regularly. Organic acids in the water supply have been very effective in controlling Salmonella on some farms and can improve pig growth rates and FCR. Organic acids are very corrosive and can damage pipes.

Has your water supply been checked for potential Salmonella contamination?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are steps taken to avoid water contamination by birds (eg outdoor troughs)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is your water system resistant to the effects of organic acids?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are organic acids added to the water supply?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 8: Reducing Salmonella risk through how you feed pigs

Feed rarely carries Salmonella but what is fed to pigs has a big effect on whether Salmonella can survive in the gut and set up an infection. The small particle size in pelleted feed makes pigs more susceptible to Salmonella. Meal feeding reduces this susceptibility to infection and liquid feeding reduces it even more. Feeding high levels of wheat in a diet also seems to increase susceptibility. Replacing wheat with barley has been shown to reduce the risk of Salmonella. Some organic acids and probiotics have been useful in controlling Salmonella but you need to check if they work on your farm.

Do you feed liquid feed (wet-feed) all of the pigs on your unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are all dry diets fed as meal rather than as pellets?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is wheat and wheat-feed in diets restricted to a maximum of 25%?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are protein levels in diets kept to the minimum required at that stage of growth?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Have outdoor feeding systems been modified to minimise bird access to feed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are organic acids added to feed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are probiotics added to feed?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 9: Improve health and reduce stress and help the pigs to fight Salmonella

Infections with other diseases will make pigs more susceptible to Salmonella. Most Salmonellas are resistant to many antibiotics. When using antibiotics to treat other infections it can allow Salmonella to get a foothold in the gut where it can stay even after the course of treatment is finished. Dealing with other health problems and reducing antibiotic use can help to reduce the level of Salmonella.

Does the unit have a veterinary health plan?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are the recommendations in the health plan always carried out?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you know which diseases are present on your unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you get information from BPHS or WPS on the conditions found in your pigs after slaughter?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you vaccinate against all of the main diseases present on your unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you vaccinate against Porcine Circovirus Diseases eg PMWS, PDNS?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you vaccinate against Salmonella?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Does the unit have a worming policy and is it effective ?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Does the unit have a mange control policy and is it effective ?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are all diets completely free of antimicrobials?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you keep the use of antimicrobials through the water system to an absolute minimum?	Yes <input type="checkbox"/>	No <input type="checkbox"/>

### Step 10: Attention to management detail to reduce Salmonella risk on your unit

The key to good performance is attention to detail. It is the same for Salmonella control. From the farrowing house through to loading pigs on the truck to the abattoir there will be small things that can be done to reduce stress on the pigs eg eliminating draughts; or to reduce the risk of Salmonella spreading eg keeping dung out of feeders. Everyone working on the farm should be involved in looking at what is being done and in suggesting ways of doing things better.

Are sows cleaned before entry to farrowing areas?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is fostering kept to a minimum to avoid mixing sick and healthy piglets?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do milk and water dishes in the farrowing house get washed every day?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is one-way flow strictly adhered to throughout the unit with no weak pigs being held back at any stage?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are temperature and ventilation settings strictly controlled for newly-weaned pigs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is action taken to deter pigs from lying in water or feed troughs?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Are straw bedding levels always kept well below the feed troughs or drinkers?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Do you minimise spillage from feeders or drinkers on the unit?	Yes <input type="checkbox"/>	No <input type="checkbox"/>