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Diagnostic results of samplings before intervention for Salmonella started in pig herds in the Benelux

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Introduction

Salmonella is a well-known zoonosis and therefore, slaughterhouses put pressure on suppliers of slaughter pigs to deliver pigs with a low *Salmonella*-status. Aim of this paper is to give an overview of the diagnostic results from 56 herds in the Benelux that were sampled before interventions started, to see which *Salmonella* types are present in which locations and animal categories.

Material and Methods

Faecal, dust or sock samples were collected either by IDT Biologika staff or the herd veterinarian after instruction. Faecal samples are pools of faeces from the floor; dust was collected using a small cloth (Swiffer®) or socks which were worn over a boot. Sock and dust samples (figure 1 and 2 respectively) were collected in the compartments or in hallways connecting compartments of a certain animal category.

Photo 1: Collecting a sock sample of faeces for bacteriological investigation

Salmonella isolation was done based on ISO standards. Most isolates were serotyped to serogroup level with additional typing for S. Typhimurium and S. Derby. Results were collected in an Excel database (version: 14.0.7232.5000 (32 bit)) and pivot tables were used to create descriptive statistics.

Photo 2: Collecting a dust sample for bacteriological investigation

Results

934 Samples (faeces N=66, dust N=241, sock N=627) were collected from a total of 56 herds in the years 2015 (58 from 5 herds), 2016 (255 from 11 herds), 2017 (334 from 21 herds) and 2018 (287 from 19 herds). 39% of dust, 37% of socks and 29% of faecal samples were positive, respectively (table 1).

Table 1: Total number, number of Salmonella positive samples and negative samples for dust, sock and faecal samples collected in swine herds respectively.

sample	negative	positive	total	% positive
dust	146	95	241	39.4%
fecal	47	19	66	28.8%
sox	396	231	627	36.8%
total	**589**	**345**	**934**	**36.9%**

For 634 samples the sampling location or animal category was registered. Of the breeding gilts / grow/finishers 38% of 195 samples were positive, for weaned piglets 49% out of 209, for sow in the insemination (AI) centre 36% out of 49, for gestating sows 35% out of 60, and for farrowing sows 21% out of 87 samples were positive. 12 out of 24 samples from central corridors were positive. For breeding gilts / grow/finish pigs 35% (N=55) of the samples from the corridors were positive and 40% (N=140) from the actual compartments. For weaned piglets 42% (N=57) and 51% (N=152) were positive respectively (table 2).
A total of 250 Salmonella isolates were typed (Table 3). 73% of all *Salmonella* in weaned piglets were S. Typhimurium. In breeding gilts / grow/finish pigs this was 55%, in gestating sows 33% and in sows in the AI centre 22% respectively. Other *Salmonella* types found were S. Derby (9%), serogroup B

(not S. Typhimurium nor S. Derby) (10%), serogroup C (10%) or E (1%) or rough (N=1). 34 isolates were found to be Salmonella but could not be typed any further for various reasons.

Discussion

Weaned piglets are often positive for S. Typhimurium and therefore an important source of infection of breeding gilts or grow / finish pigs. Corridors are often contaminated and can be a source of infection. Both should therefore be included in a comprehensive intervention plan including all-in/all-out management, proper cleaning and disinfection of compartments and corridors, strict internal and external biosecurity, proper pest control, the application of organic acids in feed and/or drinking water and, if applicable, vaccination of sows, replacement stock and piglets against *Salmonella* Typhimurium.

Table 2: Breakdown of number negative, Salmonella positive and total number of samples by animal type and location

Location	Corridor *				pens				outside			Grand	Total
Animal category	neg.	pos.	total	% pos	neg.	pos.	total	% pos	neg.	pos.	total	total	% pos
breeding gilt / grower_finisher	36	19	55	35%	84	56	140	40%				195	38%
central corridor	12	12	24	50%								24	50%
farrowing sow	6	2	8	25%	63	16	79	20%				87	21%
gestating sow	26	15	41	37%	13	6	19	32%				60	35%
Dressing room	6	1	7	14%								7	14%
insemination sow	1		1		29	18	47	38%				48	64%
insemination sow / gestating sow					1		1					1	0%
Outside#									1	1	2	2	50%
quarantaine					1		1					1	0%
weaned piglet	33	24	57	42%	74	78	152	51%				209	49%
Grand Total	120	73	193	38%	265	174	439	40%	1	1	2	634	39%

* Corridor: corridor connecting several compartments for this animal type. # Outside in the yard.

Table 3: Breakdown of type of Salmonella found by animal category or location

Salmonella type / Animal category	Derby	Enterica subspefcies (rauhform)	Group B	Group C	Group E	pos no type	Typhimurium	Typhimurium+Derby	Grand Total
breeding gilt/grower_finisher	10		14	8	1	2	42		77
central corridor	1		1			3	6	1	12
farrowing sow	2		3	4		5	4		18
gestating sow	2	1	1	4	1	3	7	2	21
Dressing room								1	1
insemination sow	5		1	2		6	4		18
Outside in the yard							1		1
weaned piglet	2		4	7		15	74		102
Grand Total	22	1	24	25	2	34	138	4	250