

Supplementary Material

Cleanliness of pigs on arrival at the abattoir and its impact on the microbial status in the lairage and after singeing: a cross-sectional study regarding different husbandry systems

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Table S1 Details for the 20 delivery batches investigated in the study

Batch number	Husbandry system	Husbandry condition	Salmonella antibody status (Anonymous 2017)	Transport distance (farm of origin to the abattoir)	Transport floor condition	Total number of pigs in the batch	Number of pigs for visual assessment at herd level (during unloading)
1	Organic	Straw bedding and outdoor area	Low (category 1)	50–100km	Sawdust	140	25
2	Organic	Straw bedding and outdoor area	Low (category 1)	50–100km	Sawdust	49	10
3	Organic	Straw bedding and outdoor area	Low (category 1)	> 100km	Sawdust	80	16
4	Organic	Straw bedding and outdoor area	Low (category 1)	< 50km	Sawdust	50	10
5	Organic	Straw bedding and outdoor area	Low (category 1)	> 100km	Sawdust	78	15
6	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust	165	32
7	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	60	10
8	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust	164	30
9	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	92	16
10	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust	160	29
11	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	50	15
12	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	60	11
13	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	118	22
14	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust	46	7
15	Organic	Straw bedding and outdoor area	Low (category 1)	50–100km	Sawdust	46	8

16	Organic	Straw bedding and outdoor area	Low (category 1)	> 100km	Sawdust	60	11
17	Organic	Straw bedding and outdoor area	Low (category 1)	< 50km	Sawdust	72	13
18	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	75	11
19	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust	39	7
20	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust	72	11

Table S2 Details for the 120 pigs investigated in the study

Pig ID	Batch number	Husbandry system	Husbandry condition	Salmonella antibody status (Anonymous 2017)	Transport distance (farm of origin to the abattoir)	Transport floor condition
1–6	1	Organic	Straw bedding and outdoor area	Low (category 1)	50–100km	Sawdust
7–12	2	Organic	Straw bedding and outdoor area	Low (category 1)	50–100km	Sawdust
13–18	3	Organic	Straw bedding and outdoor area	Low (category 1)	> 100km	Sawdust
19–24	4	Organic	Straw bedding and outdoor area	Low (category 1)	< 50km	Sawdust
25–30	5	Organic	Straw bedding and outdoor area	Low (category 1)	> 100km	Sawdust
31–36	6	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust
37–42	7	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
43–48	8	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust
49–54	9	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
55–60	10	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust
61–66	11	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
67–72	12	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
73–78	13	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
79–84	14	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust
85–90	15	Organic	Straw bedding and outdoor area	Low (category 1)	50–100km	Sawdust
91–96	16	Organic	Straw bedding and outdoor area	Low (category 1)	> 100km	Sawdust
97–102	17	Organic	Straw bedding and outdoor area	Low (category 1)	< 50km	Sawdust
103–108	18	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
109–114	19	Conventional	Fully slatted or partially slatted floor	Low (category 1)	< 50km	Sawdust
115–120	20	Conventional	Fully slatted or partially slatted floor	Low (category 1)	50–100km	Sawdust

1 Slaughter line

After arriving at the abattoir, the pigs were driven to the lairage where they rested for approximately one to two hours. No showering was performed in the lairage as the temperatures were between 6 and 10 °C. The pigs were stunned with carbon dioxide (Butina A/S, Holbæk, Denmark), and for bleeding, blood-draining knives were used on carcasses in a rotating carousel in a hanging position (Anitec AB, Malmö, Sweden). Next, pre-washing took place, and afterwards, the carcasses were scalded in a steam tunnel at 63.5 °C (BANSS Schlacht- und Fördertechnik GmbH, Biedenkopf, Germany). The carcasses were dehaired using rotating scrapers/rubber whips (BANSS Schlacht- und Fördertechnik GmbH, Biedenkopf, Germany). Singeing/flaming was carried out in two successive ovens, with wet polishing between the ovens (BANSS Schlacht- und Fördertechnik GmbH, Biedenkopf, Germany) (Fig. S1). The subsequent process steps of evisceration, carcass cutting, post-mortem inspection, carcass weighing, and chilling are not described in detail as the sampling took place before cutting, and consequently, these steps were not relevant for this study.

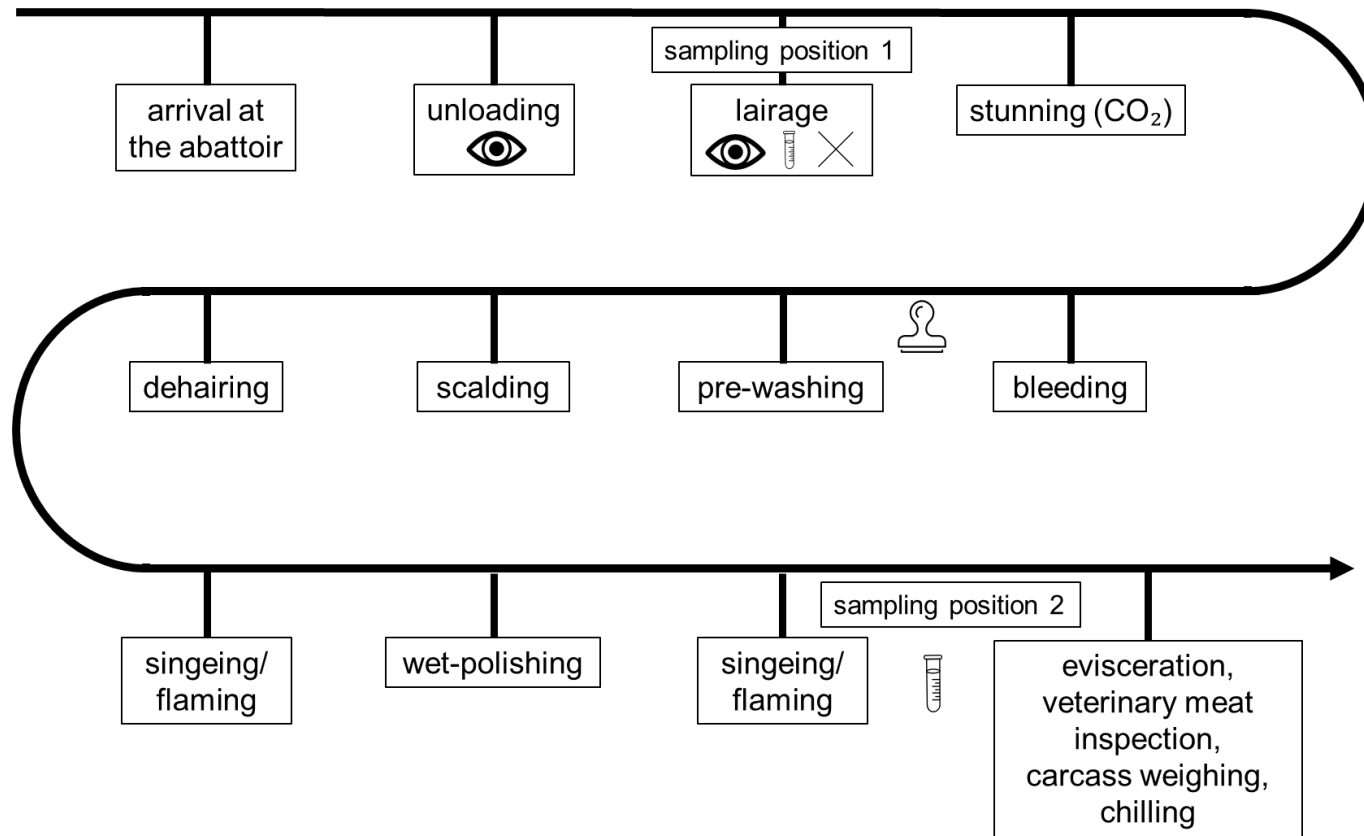


Fig. S1 Slaughter line including visual assessment and sampling positions

( = visual assessment;  = sampling point;  = marking;  = tattooing)

2 Microbiological examinations

To prepare the non-selective pre-enrichment as a basic homogenate for TVC and Salmonella detection, to each sample bag (with the sponge and 10 mL neutralizing buffer) 90 mL of buffered peptone water (Merck KGaA, Darmstadt, Germany) was added. Subsequently, the contents of the sample bags were homogenized for 120 seconds using a stomacher (bioMérieux, Marcy-l'Étoile, France) at a speed of 560 strokes/minute. The resulting basic homogenate was used for quantitative analysis of TVC and qualitative analysis of Salmonella.

2.1 TVC

For quantitative analysis of TVC, a decimal dilution series from each basic homogenate using sodium chloride peptone agar (Merck KGaA, Darmstadt, Germany) was prepared. From the basic homogenate and each dilution series, duplicate 0.05 mL amounts were dropped onto plate count agar (PCA) (Th. Geyer GmbH & Co. KG, Renningen, Germany), and PCA plates were incubated for 48 ± 2 h at 30 °C. Counts from two consecutive dilution levels were used to obtain a weighted average count for each sample.

2.2 Isolation and identification of Salmonella

The homogenized samples were examined following the ISO protocol for Salmonella (ISO 2020). Colonies that were considered typical or suspected of Salmonella underwent agglutination tests (Sifin Diagnostics GmbH, Berlin, Germany). Agglutinating colonies were purified on PCA. Further confirmation of Salmonella was performed by polymerase chain reaction following Rahn et al. (1992) for suspect colonies that showed autoagglutination or aggregation. Serotyping was conducted following the Kauffmann-White-Le Minor scheme (Grimont et al. 2007).

References

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