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Assessing hygiene proficiency on organic and conventional pig farms regarding pork safety: A pilot study in Finland

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Abstract

A key element in the EU Common Agricultural Policy (CAP) will be a single farm payment system that is linked to compliance with rules on, for instance hygiene standards. However, there are no recommended methods for assessing the hygiene proficiency of pig production farms. The present study was undertaken to develop a method for this purpose. A first implementation was done on pilot scale; with a set of both conventional and organic pig farms ($N=15$). Fifty hygiene-related factors were selected, especially with reference to the possible proliferation of enteric pathogens *Listeria monocytogenes*, *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*. The factors were allocated into 8 evaluation categories: (1) general production management, (2) animal density, (3) the outdoor area for pigs, (4) pest and pet animals, (5) general hygiene in the piggery, (6) pen hygiene, (7) feed production hygiene, and (8) feeding hygiene. A farm questionnaire and a supplementary on-site observation form were devised, and one arbitrary scale of hygiene points assigned for each factor. In addition to the mailed questionnaires, one person subsequently visited all the farms, perused the questionnaire with the owners and completed the observation form. The hygiene scores of the farms in each evaluation category were compared both without weighting and with weighting based on expert opinions. The method proved to be feasible and applicable to different types of production.

Keywords: Hygiene proficiency; Hygiene scores; Pigs; Pre-harvest; Pork safety; Public health

1. Introduction

The majority of pathogenic bacteria that can spread at slaughter by cross-contamination can be traced back to the pig production rather than originating from the inherent slaughter plant microflora (e.g. Nesbakken et al., 1994; Skovgaard and Nørrung, 1989; Autio et al., 2000; Wegener et al., 2003). Retail pork has been shown to be an important source of human *Yersinia enterocolitica* infection (Fredriksson-Ahomaa et al., 2001b), and in some European countries pork and pork products are now recognized as one of

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Table 1
List of factors used in hygiene evaluation for finishing pigs at the pre-harvest level and two scoring systems used in this study

Evaluation category	Sub-category	Hygiene factors[a]	Reference	Scores	
				Original	Weighted
1. General production management (total)				0–10.0	0–14.5
	Production type	Slaughter production	Skjerve et al., 1998	0–2.0	0–4.5
	Animal flow strategies	Continuous production	Fukushima et al., 1983	0–2.0	0–4.0
	Origin of pigs	Purchased pigs, mixing litters and purchased from several supplier herds	Fukushima et al., 1983; Kapperud, 1991	0–2.0	0–2.0
	Group size	Large group size		0–2.0	0–2.0
	Unit size	Large unit size	Belœil et al., 2003; Skjerve et al., 1998	0–2.0	0–2.0
2. Animal density (total)				0–10.0	0–12.5
	Space per pig	Low, under national rules, <0.65 m^2/pig	Anonymous, 2004; Tubbs and Zulovich, 1995	0–10.0	0–12.5
3. Outdoor area for pigs (total)				0–10.0	0–7.0
	Indoor housing with outside run	Access to outdoor areas	Lovett, 1989	0–1.5	0–1.0
	Feeding	Feeding in the open	Kämpfer, 2000	0–2.0	0–1.5
	Drinking	Uncovered drinking bowl in the open	Schiemann, 1989	0–2.0	0–1.5
	Base material	Soil	Cork et al., 1995; Lovett, 1989	0–2.0	0–1.0
	Cleanliness	Dirty and wet outside area	Schiemann, 1989; Skovgaard and Nørrung, 1989	0–2.5	0–2.0
4. Pest and pet animals (total)				0–10.0	0–10.0
	Flies	Abundant flies inside the piggery	Fukushima et al., 1979	0–1.5	0–0.5
	Birds	Easy access to the piggery	Niskanen et al., 2003; Kämpfer, 2000; Weis and Seeliger, 1975	0–1.5	0–2.0
	Cats	Easy access to the piggery	Fredriksson-Ahomaa et al., 2001a; Kapperud, 1991	0–1.5	0–0.5
	Dogs	Easy access to the piggery and outdoor areas	Fredriksson-Ahomaa et al., 2001a; Kapperud, 1991	0–1.0	0–1.0
	Rodents	Moderate numbers or sometimes numerous in the piggery	Kapperud, 1991; Kämpfer, 2000	0–1.5	0–2.5
	Pest animals access to the feed storages	Not able to limit access	Kämpfer, 2000	0–1.0	0–2.0
	Pest animals access to the litter storages	Not able to limit access	Kämpfer, 2000	0–1.0	0–1.0
	Other animal species	Other animals kept in same airspace as pigs	Kämpfer, 2000	0–1.0	0–0.5