

Generic HACCP Plan for the Production of Pig Offal and By-products Destined for Domestic and Export Markets under Australian Conditions

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Background

Traditionally, pig offals have been regarded as low quality product compared to muscle meat. However, this is not the case in the Asian markets where pig offals are highly valued, and premium prices are paid for good quality product (Project LMA.8P progress report). Few Australian pig processing plants make full utilisation of the commercial potential of the pig offals. A small number of domestic and export licensed works have realised that Asian export markets and to a lesser degree, Australian domestic markets, provide an opportunity to increase profit margins. The Australian industry has recognised that traditional process methods need to be examined and improved, in light of the current food safety issues.

Objectives

This project has been undertaken in partnership with an export licensed pig processing plant, to develop generic HACCP plans modelled on the offal processing lines at this plant, which can then be applied (with minor modifications) to other Australian plants. It is envisaged that the adoption of these plans will contribute to increasing exports of Australian produced pig products.

Methods

A microbiological investigation of pig offals, namely heart, liver, kidney, stomach, tongue and trotters was undertaken at the partnership plant. This investigation examined products for the presence of *Salmonella* (AS1766.2.5), *E.coli*/coliforms by Petrifilm™, coagulase positive staphylococci (CPS) (AS1766.2.4), *Yersinia enterocolitica* (Barton *et.al.* 1997, modified) , and *Clostridium* spp. (AS1766.2.7 modified). Product was sampled immediately after evisceration or removal from the carcass, and then in the offal processing room prior to product being packed. The cold chain was time/temperature monitored using Tiny Tags™ from the point of packaging at the abattoir to the cold storage facility where product is frozen and then transported overseas. In light of the microbiological findings, a hazard analysis was carried out on the offal processing procedures. Potential points of microbial contamination were identified, preventative measures to control microbial contamination and routine monitoring procedures were devised as part of the generic HACCP plans.

Results and Discussion

All the bacterial under investigation were detected on at least one offal type as shown in Table 1 below.

Table 1: Potential bacterial hazards detected from whole organ washes of various pig offal
(CPS: coagulase positive Staphylococci, +: detected, -: not detected).

Offal	Microorganism					
	<i>E.coli</i>	Coliforms	<i>Salmonella</i>	<i>Yersinia</i>	CPS	<i>Clostridium</i>
Heart	-	-	-	-	+	-
Liver	+	+	-	-	+	-
Kidney	+	+	+	-	+	+
Tongue	+	+	+	+	+	-
Trotter	+	+	+	-	+	-
Stomach	+	+	+	-	+	+



Indication of faecal contamination was evident in all offal except for the heart which highlighted the need for monitoring the evisceration/removal procedure, which is identified as a critical control point in the production of pig carcasses (Anon. 1994). Coagulase positive staphylococci were detected on all offals which can be attributed to the extensive operator handling these products undergo. Plant operator hygiene must be stringent and where possible handling of product should be minimised. By far the most important step in all of the offal production procedures is the chilling process and then maintaining the cold chain once product leaves the abattoir to ensure growth of faecal bacteria and coagulase positive staphylococci is not permitted.

Conclusions

The clean, safe production of Australian pig offal can be improved by the implementation of HACCP plans on the processing lines, and so ensuring a quality product is available to the Asian export markets as well as the Australian domestic market. The critical control points common in each of the offal processes can be limited to the evisceration of carcasses, and chilling the product. However, careful attention needs to be given to the personal hygiene of the operators as extensive handling is involved in the production of these products. Modification of the pig offal production processes to minimise product handling would significantly reduce potential microbiological hazards.

References

1. Anon. 1994. Generic HACCP Model for Swine Slaughter. USDA/FSIS HACCP-5.
2. Australian Standard Food Microbiology AS1766.2.4 1994 Examination for specific organisms - Coagulase-positive staphylococci.
3. Australian Standard Food Microbiology AS1766.2.5 1991 Examination for specific organisms - Salmonellae
4. Australian Standard Food Microbiology AS 1766.2.7 1991 Examination for specific organisms - *Clostridium botulinum* and *Clostridium botulinum* toxin
5. Barton, M.D., V. Kolega, and S.G. Fenwick (1997). *Yersinia enterocolitica*. In Foodborne Microorganisms of Public Health Significance, 5th edn. AIFST Food Microbiology Group.
6. Project LMA.8P: Improving returns from pig offal, Progress report 1995, Pig Research and Development Corporation.

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