

COMPARISON OF REGULATIONS AND METHODS FOR THE BACTERIOLOGICAL MEAT INSPECTION IN EUROPEAN COUNTRIES

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Keywords: Bacteriological meat inspection, European countries

Background

Council Directive 64/433 EC is the basis for the bacteriological meat inspection of carcasses. Details are left to the member states. The objective of this study was to investigate whether, and to what extent, this freedom has been filled by European countries. Recommendations, regulations, practical aspects and methods concerning the bacteriological meat inspection were collected and compared.

Material

From 1995 until 1997 a survey was carried out in 14 European countries. We contacted veterinary faculties, universities, and ministries asking for the current recommendations and legal regulations concerning details of the bacteriological examination of meat, e.g. indications, samples and transport, laboratory methods, and consequences.

Results

Regulations and present state. As shown in Table 1 current compulsory legal regulations were available from nine European countries. Other countries, e.g. Ireland and Spain carry out a bacteriological meat inspection on the basis of recommendations and leave methodological details to the responsibility of the veterinarian respectively to the laboratory practice. From the documents available it could be concluded that in some countries certain aspects of the bacteriological meat inspection are laid down legally, e.g. indications, obligatory samples, or final judgement of carcass and organs, whereas the analyst is responsible for the details of the examination procedures. Some countries have no bacteriological meat inspection, many discuss its abolition or reform.

Samples. Obligatory samples differ between 1 to 8 within European countries. Samples are e.g. spleen only spleen and liver only spleen, liver, muscle and lymphnode. Some countries add kidney, gall bladder, liver lymph node, and suspicious tissue. Most countries prescribe the use of sterile or clean instruments for sampling, e.g. specified by "flaming". If transport is necessary, cooling is recommended in most cases. If compulsory temperatures are given they vary between 0 °C to + 4°C or below + 10 °C.

Laboratory methods. They could only be compared on condition that details were laid down by the countries in regulations or recommendations available for this study. Table 2 lists samples and procedures for each examination step. Table 3 gives some details concerning the examination steps for Salmonella enrichment and detection, Table 4 for Clostridia examination.

Discussion

Within Europe regulations, procedures and laboratory methods for the bacteriological meat inspection vary to a considerable extent. Meaningfulness of bacteriological meat inspection has been doubted repeatedly by experts. Furthermore it has been criticized that the current bacteriological meat inspection does not cope with nowadays meat hygiene problems. If the bacteriological meat inspection shall be carried out in future, a reform and harmonization within European countries seems to be necessary.

Table 1 Regulations and recommendations concerning bacteriological meat inspection available for this study

Country	Regulations
Ireland, Spain	Recommendations, veterinarian responsible for details
Austria, Belgium, Denmark, Germany, Finland, Iceland, Netherlands, Sweden, Switzerland	
	Compulsory regulations

Table 2 Laboratory procedures and samples for the bacteriological meat inspection

Direct streaking on blood or nutrient media	CH	D	DK	E	FIN	NL	S
Muscle	+	+	+	+	+		
Lymph node	+	+	+	(2)			(1)
Spleen	+	+	+	+	+	+	+
Liver	+	+					
Kidney	+	+					
Direct streaking on <i>Salmonella</i> selective media	CH	D	DK	E	FIN	NL	S



Muscle	+	+	+	+			
Lymph node	+	+	+	(2)			
Spleen	+	+	+	+			
Liver	+	+					
Kidney	+	+					
Examination for <i>Salmonella</i> by enrichment procedure	CH	D	DK	E	FIN	NL	S
Muscle	+	+	+				
Lymph node	+	+	+	(2)			(1)
Spleen	+	+	+	+			+
Liver	+	+	(3)	(4)	(4)		+
Kidney	+	+					
Examination for <i>Clostridia</i>	CH	D	DK	E	FIN	NL	S
Muscle	+	+	+	+	+		+
Lymph node			+	(2)			(1)
Spleen			+	+	+		+
Liver	+						

(1) if spleen not available (2) mesenteric lymph node (3) including gall bladder (4) including gall bladder and liver lymph node

Table 3 Details of procedure for *Salmonella* examination

Examination for <i>Salmonella</i>	A	CH	D	DK	E	FIN	S
Pre-enrichment			(5)				+
Enrichment	T/(6) RV	T	T/S/RV	T/S	T/S	T/S	RV
Selective media	2, free choice	BPLA + 1, free choice	BPLA + 2, free choice	BPLA + TSI	free choice	BPLA/TSI/Urea	BPLA + XLD
Biochemical and serological confirmation	+		+	+	+	+	+

(5) if meat is frozen, dried, or prepared, pre-enrichment is obligatory (6) / = alternatives for media use
 T = Tetrathionate broth, S = Selenite Cystine broth, RV = Rappaport-Vassiliadis broth, BPLA = Brilliant Green Phenol Red Lactose Agar, TSI = Triple Sugar Iron Agar, Urea = Urea Agar, XLD = Xylose Lysine Desoxycholate Agar

Table 4 Details of procedure for *Clostridia* examination

Examination for <i>Clostridia</i>	A	CH	D	DK	E	FIN	S
Liquid/solid media	Blood Agar	Thio-glycollate Medium	Liver Broth acc. to Kelch	Iron Sulfite Agar	Iron Sulfite Agar or other	Iron Sulfite Agar or other	Blood Agar
Further procedure		Blood Agar	GRAM-staining, Blood Agar				