Residues of veterinary drugs in meat and meat products of Switzerland

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Background

Occasional alarming news in media from time to time suggest that our food is contaminated with toxicologically critical substances to a great extent. Especially products of animal origin are suspected; vegetable products exhibit a better image from the start. More ore less dangerous substances are generally spread in our natural environment or in that determined by technical influences. As a consequence, food may contain unwanted or even dangerous substances. Some years ago, several cases of poisoning occurred in France and Spain when consumers ate beef livers contaminated with Clenbuterole, a β-agonist, by illegal application [1].
Besides facts like those mentioned above there are, nevertheless, also unproven or simply false charges and statements. In most cases it is difficult for a person without relevant knowledge to decide whether or not there might be a real danger. Neither the size of headlines nor the consumers' occasionally cited competence offer an objectively valid criterion.

Objectives

To gain a summary survey of the contamination of meat and meat products in Switzerland in 1996.

Methods

Substances with hormonal activity: Determined by enzyme linked immunosorbent assay (ELISA), verified by GC-MS
Nitrofuranes: Determined by HPLC
Chloramphenicole: ELISA, verified by gas chromatography with ECD
Sulphonamides: CHARM-test

Results, conclusions

The results show clearly that only a very few number of the analysed samples are contaminated with residues of veterinary drugs. From a consumers' point of view it can be stated that there is no danger when eating meat in Switzerland.

Pertinent litterature

[1] Salleras, L.; Dominguez, A.; Mata, E.; Taberner, J. L.; Moro, I. und Salva, P.: Epidemiologic study of clenbuterol poisoning in Catalonia, Spain. Public Health Reports 1995: 110: 336.
[2] Report 1996 of the border veterinarian service of the Swiss Veterinary Office.
[3] National examination programme 1996 of the Swiss Veterinary Office.

Data in the form of tables

Table 1. Substances with hormonal activity (dienestrole, diethylstilbestrole, hexestrole, zeranole, trenbolone, 17-ß-estradiol and ester, testosterone and ester, methyltestosterone, nortestosterone and ester)

Contaminant	Species	Matrix	Number of samples	negative	positive
Derivatives of stilbenes	Calves	Urine	110	110	0
	Cattle/Bulls	Urine	120	120	0
	Calves	Blood	120	120	0
	Cattle/Bulls	Blood	100	100	0
Naturally occurring hormones	Cattle	Fat	55	55	0
Zeranole, Trenbolone	Calves	Urine	120	120	0
	Cattle/Bulls	Urine	120	120	0
Gestagenes	Calves	Fat	55	55	0

Table 2. Antimicrobial agents (chloramphenicole, sulphonamides, nitrofuranes, benzimidazoles, ivermectine)

Contaminant	Species	Matrix	Number of samples	negative	positive
Chloramphenicole	Calves	Liver	120	120	0
	Cattle/Bulls	Liver	120	120	0
	Cows	Liver	120	120	0
	Pigs	Liver	120	120	0
Sulphonamides	Calves	Liver	120	114	6
	Cattle/Bulls	Liver	120	120	0
	Cows	Liver	120	120	0
	Pigs	Liver	120	118	2
Nitrofuranes	Calves	Liver	120	120	0
	Cattle/Bulls	Liver	120	120	0
	Cows	Liver	120	120	0
	Pigs	Liver	120	120	0

Benzimidazoles	Calves	Leber	120	120	0
	Cattle/Bulls	Leber	120	120	0
	Cows	Leber	120	120	0
	Pigs	Leber	120	120	0
Ivermectine	Calves	119	119	119	0
	Cattle/Bulls	120	120	120	0
	Cows	120	120	120	0
	Pigs	120	120	120	0

Table 3. Anthelminthic and antimicrobial agents (benzimidazoles, ivermectine)

Contaminant	Species	Matrix	Number of samples	negative	positive
Benzimidazoles	Calves	Liver	120	120	0
	Cattle/Bulls	Liver	120	120	0
	Cows	Liver	120	120	0
	Pigs	Liver	120	120	0
Ivermectine	Calves	Liver	119	119	0
	Cattle/Bulls	Liver	120	120	0
	Cows	Liver	120	120	0
	Pigs	Liver	120	120	0

Table 4. Tranquillizing agents (azaperone/azaperole, acepromazine/propiopromazine, carazolole)

Contaminant	Species	Matrix	Number of samples	negative	positive
Azaperone/ Azaperole	Pigs	Liver	110	110	0
Acepromazine/ Propiopromazine	Cattle/Bulls	Urine	110	110	0
Carazolole	Pigs	Liver	110	110	0

Table 5. ß-Agonists (clenbuterole, salbutamole)

Contaminant	Species	Matrix	Number of samples	negative	positive
Clenbuterole	Calves	Urine	240	240	0
Salbutamole	Calves	Urine	240	240	0

Table 6. Chloramphenicole

Contaminant	Species	Matrix	Number of samples	negative	positive
Chloramphenicole	Trouts	Muscle	23	23	0

Table 7. Derivatives of quinolones (oxolinic acid, flumequine)

Contaminant	Species	Matrix	Number of samples	negative	positive
Oxolinic acide	Trouts	Muscle	51	50	1
Flumequine	Trouts	Muscle	51	49	2

Table 8. Nitroimidazole (dimetridazole)

Contaminant	Species	Matrix	Number of samples	negative	positive
Dimetridazole	Poultry	Muscle	29	29	0

Table 9. Anticoccidium (nicarbazine)

Contaminant	Species	Matrix	Number of samples	negative	positive
Nicarbazine	Rabbits	Muscle	30	30	0

Table 10. Derivatives of triphenylmethanes (malachite green)

Contaminant	Species	Matrix	Number of samples	negative	positive
Malachite green	Fish/Fish products	Muscle	114	87	27