Program to Control Sulfa Drugs in Pork

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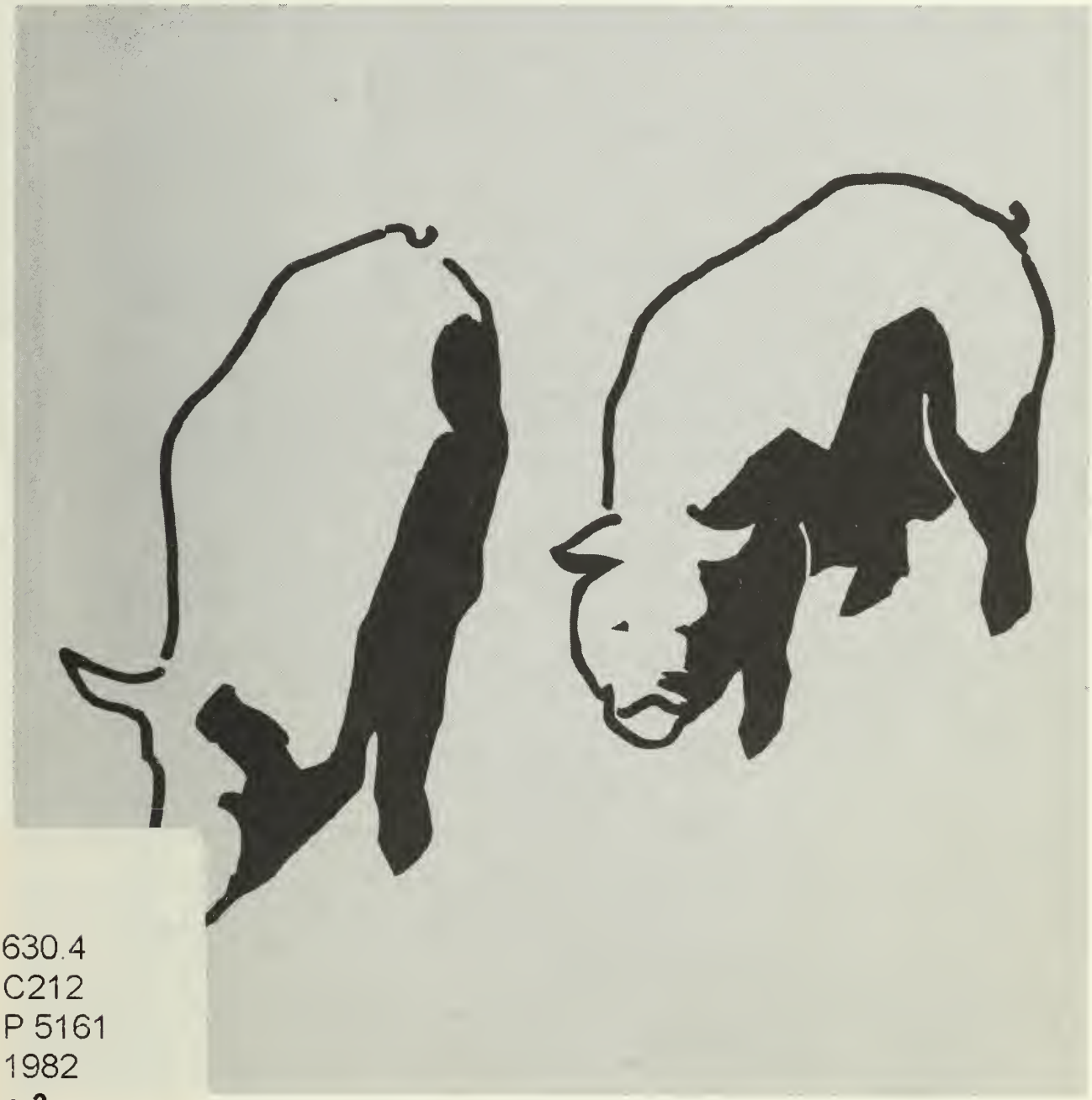

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Why are residues monitored?

An animal exposed to drugs, chemicals and environmental pollutants often stores traces of these in its tissues. Although the amount of any single compound may be small, a great variety may accumulate, adulterating the animal's meat. Therefore, the presence of any residual drugs or chemicals in meat is unacceptable.

Other countries check our meat products for contamination, so monitoring for residues in slaughter animals is essential to sales, both domestic and export.

The Canada-U.S. agreement for control of sulfa drugs in pork

Sulfa drugs were first identified as a residue problem in 1976. As the problem became recognized as widespread in both countries, refusals of contaminated shipments threatened to disrupt the Canada-U.S. pork trade. Both countries therefore decided on a program to reduce the incidence of contamination.

The control program

The Food Production and Inspection Branch of Canada Agriculture conducts a three-part program to reduce residues from sulfa drugs:

An educational campaign to advise owners of proper use of sulfa drugs and ways to avoid residues;

Monitoring of slaughter animals for adulteration;

Surveillance of farms where animals are identified as contaminated, and of feedmills to avoid contamination of non-medicated feed and ensure proper labelling of feed.

Producer organizations were informed, and Agriculture Canada sent a news release to the media. News articles are published from time to time in trade journals, and inspection personnel make personal contact with producers.

Control and use of sulfa drugs

The Bureau of Veterinary Drugs, Health Protection Branch, Health and Welfare Canada reviews and licenses the sale of drugs for animal use. Package labels must show species limitations, dosage levels, intended use, required withdrawal times and other pertinent information. Sulfa drugs do not require a veterinary prescription; the user, however, must follow the restrictions on the label.

The sale of medicated feeds is regulated by the Feed and Fertilizer Division, Food Production and Inspection Branch, Agriculture Canada. Drug premixes that are available without veterinary prescription are listed in a Compendium of Medicated Ingredients. Aureo SP250 and Chlorachel 250 SWINE are the only sulfa drugs listed for pigs and are restricted to starter and prestarter feeds. These medications are intended to maintain growth and feed efficiency of animals in the presence of athrophic rhinitis, and maintain growth rate and stimulate appetite of young pigs and breeding stock during certain stress periods. They may also be used to prevent bacterial enteritis in breeding stock rations.

The use of sulfa drugs in grower and finisher rations for market hogs requires the prescription of a veterinarian, and is restricted to herds with disease problems. Owners also can use sulfa drugs to medicate drinking water. In every case, they must obey a minimum withdrawal period of 10 days before slaughter.

Common causes of sulfa residues in meat

Failure to observe withdrawal times. This occurs when a producer doesn't withdraw hogs from all sulfa medication in feed and water for a minimum of 10 days before marketing, or when he or his feed supplier adds sulfa to grower or finisher rations for market hogs. However, if sulfa is prescribed, the veterinarian must set the necessary withdrawal period, and the producer must observe it.

Failure to ensure complete withdrawal. This happens when the hogs contact residual or contaminant amounts of sulfa drugs during the withdrawal period, even though the producer has withdrawn them from intentionally supplied feed and water medication. Because the drugs are electrostatic, they cling to equipment. Mixers, bins, conveyors or feeders used for medicated rations may carry drugs over into later feeds unless scrupulously cleaned first. Producers should realize that 2 ppm residue in finisher rations can cause violative levels in the liver. This is a problem for both livestock producers and commercial feed manufacturers.

For proper withdrawal, a producer must take many precautions:

- A thorough cleanup of all feed-mixing, conveying and feeding equipment. Ideally, pigs should be moved to withdrawal pens.

- If it is not possible to move pigs to clean withdrawal pens, feeders should be changed. Also, manure must be removed and the pens washed daily.
- As pigs must not contact contaminated feces from adjacent pens, solid-wall partitions should be placed between pens receiving medicated and non-medicated feeds.
- New pigs just starting withdrawal must not be put in the same pens as pigs already on the 10-day withdrawal period.
- Pigs should be kept away from flush-type cleanout systems that use recycled liquids, as these may offer sulfa residues to the pigs.
- Hogs from different producers must not be mixed during shipping unless all the producers have followed a conscientious withdrawal program.

Failure to keep medicated and non-medicated feeds properly identified and segregated. A medicated pig starter supplement or premix, unintentionally used, will definitely contaminate a hog grower or hog finisher and result in violative residues. Adjacent bins for medicated and non-medicated feeds, if improperly built, invite contamination; it takes less than 20 kg of normally medicated starter feed to contaminate a tonne of finisher.

The monitoring program

The monitoring program for sulfa drugs started in 1979. It uses random sampling, based on slaughter figures. To evaluate regional differences, the sampling plans are divided into three regions: the Western provinces; Ontario and the Maritimes; and Quebec. About 1000 liver samples are tested each year. These are collected in slaughter plants at a specified day and time, immediately frozen and sent to the laboratory for examination. Thin-layer chromatography is used for screening. Samples showing sulfa residues of 0.1 ppm or greater are further tested by gas-chromatography and mass-spectrometry. Testing time is at least 3 days, at a cost of about $100 per sample. The Animal Pathology Laboratory in Saskatoon is the only departmental laboratory conducting this test.

Monitoring test results

	No. tested	No. pos.	%
April 1, 1979 to March 31, 1980			
Samples taken	794	73	9.19
Imports samples	128	4	—
April 1, 1980 to March 31, 1981			
Samples taken	793	57	7.18
Western provinces	207	12	5.7
Ontario & Maritimes	339	19	5.6
Quebec	247	26	10.5
Imports samples	71	Nil	—
April 1, 1981 to February 12, 1982			
Samples taken	783	70	8.9
Western provinces	274	14	5.18
Ontario & Maritimes	277	21	7.58
Quebec	232	35	15.08
Imports samples	115	1	

The surveillance program

When a liver sample is found to be positive, the laboratory reports it the same day to the office of the chief of residues by computer hookup. This office immediately phones staff at Feed and Fertilizer Division headquarters, who in turn inform the regional offices. The regional offices notify the field office in the area where the farm of origin is located. The province's marketing board is telephoned at the same time. In the case of Quebec, regional offices of both the Veterinary and Production and Inspection Operations Directorates are notified by facsimili. In addition, a list of positive owners is distributed monthly to regional offices, marketing boards and hog slaughtering establishments. The information includes the level of sulfonamide found in the liver, the establishment where the sample was taken and date of sampling, the tattoo of the hog and the name and address of the owner.

A Production and Inspection field inspector tells the owner, on the same or following day, that a positive sample of his hogs has been found, and sets a date for a visit to the farm as soon as possible.

During the visit, the inspector explains the program in detail. He tries to identify the source of contamination, takes samples of grower and finisher feed, and recommends clean-up procedures. He advises the owner not to market any more hogs until the premises are cleaned and non-medicated feed used for at least 10 days, and then to send a sample lot of five pretest hogs. When the pretest hogs test negative, the owner is advised that normal shipment can be resumed. In cases where the source of contamination cannot be readily identified, additional samples may be

taken from feed mixers, auger systems, troughs, water flashback systems, sweepings, etc. The inspector may extend his investigation to the feed mill if it is suspected of delivering contaminated feed to the producer.

If an owner were not to ship pretest hogs after a positive had been identified, his next entire lot would have to be held at the packing plant pending test results. As slaughter, sampling, shipment of samples and analysis normally takes 2 weeks, the hogs would have to be frozen and held. This would place an excessive burden on the packing plant or marketing board. For this reason, they are refusing such shipments.

When pretest hogs are received at the packing plant, samples of liver and muscle tissue are taken and sent for immediate analysis. If liver samples are negative, the owner is advised that shipping restrictions from his farm are removed (residue levels in livers are usually higher than in muscles). Carcasses are condemned when the level in muscle tissue exceeds the tolerance limit.

To ensure that the producer continues to ship uncontaminated pigs, check samples are taken of livers from three other hogs soon after normal shipping is resumed. These hogs and the lot from which they are taken are not held pending test results. If a positive level is found among the check samples, the same procedure is followed as if a positive had been uncovered during monitoring.

Impact of the program

The Meat Hygiene Division's job is to ensure wholesomeness of meat products produced in federally inspected establishments. As part of this task, it checks for residual levels of drugs and chemicals. This cannot be done on individual carcasses or producer lots, but only by monitoring slaughter populations. The Canadian Meat Inspection system is reviewed by countries importing meat from Canada the same way as Canada reviews the systems of countries exporting meat to us. Unacceptable residue levels jeopardize both the acceptance of the Canadian system and our products on the international market.

The Feed and Fertilizer Division ensures that feeds for sale are free of deleterious substances and conform to prescribed nutritive and labelling standards.

The precautions necessary to avoid drug residues do place a burden on producers; they must pay costs of necessary clean-ups and act to ensure that only non-medicated feed is used during the withdrawal period before slaughter. But producers *must* assume this responsibility, if they are to protect their market.

S.R. Action Chart

Monitoring	MHD — HQ	national sampling plan
	MHD — Inspectors Slaughter est.	collect, forward liver samples for analysis
	An. Path. Lab., Saskatoon — computer	analyzes samples, reports results
Surveillance	MHD Chief* residue program — phone	coordinates program, issues monthly list of violative owners, evaluates results, transmits information
	HQ Feed Fertilizer — phone	transmits information
	Reg. office Prod. & Insp. Office — phone	transmits information
	Field office P.I.O.	inspector advises owner, visits farm, investigates, advises procedure, requests pretest hogs, advises of pretest results
	Marketing boards	accept only hogs from owners with no positives, except for pretest hogs
	MHD inspectors	collect liver and muscle samples from pretest hogs, hold pretest hogs pending results, expedite samples on a priority basis.
		collect check samples from production lot following pretest.

* In the case of Quebec, information on positive results and from pretest hogs is transmitted by facsimili to regional office of P.I.O. and veterinary operations, which in turn notify the field office and packing plants.