D5. Feed Handling

D5.1 Medicated Feed

The Canadian Food Inspection Agency (CFIA) routinely tests livestock products at processing. During the 1997-98 testing period, 99.6% of hogs tested in processing plants across Canada were found to be residue free. This record is commendable. Despite this excellent record, it still means that there are a small number of hogs marketed each year with a detectable drug residue. Often it is found that when a residue does occur in pork, it is related to feed medication. Residues arise because of feed mixing errors, accidental contamination and being unaware of the presence of feed medications. The importance of the problem makes it a major focus of this program.

Medications allowed in Canadian livestock feeds must be approved by Health Canada and bear a Canadian DIN (drug identification number). Label uses are listed in the *Compendium of Medicating Ingredients Brochure* (MIB), published by the Canadian Food Inspection Agency. This document lists the permitted levels of medication and describes the conditions the drug can be used to treat.

- All feed medications used in Canada must be approved by the Veterinary Drug Directorate of Health Canada.
- These approved products will bear a Drug Identification Number (DIN) and will appear in the MIB.

Feed medications include growth-promoting drugs, such as tylosin. Claims may also show that they promote feed efficiency and prevent or treat disease. Nutritional additives, such as biotin or selenium, and additives for odour control, however, are not considered to be medications; they are not listed in the MIB and do not fall under the same regulations. If you are unsure whether a product is a medication or a nutritional supplement, check with your veterinarian or provincial delivery agent.

Medications used as outlined in the MIB present no problem as they relate to drug residues. To receive approval, they were thoroughly researched to show they did not produce drug residues when an appropriate withdrawal time is applied. Regulations require feed mills to properly tag bagged feeds with a label that shows what type of animal it is to be fed to and what the withdrawal period is. Bulk feeds must be accompanied by a label.

In provinces other than Québec, there are three classifications of medicated feeds. These are: customer or producer formulas, consultant formulas and veterinary prescription feeds. Customer and consultant formulations may only include feed medications as described in the MIB. Feed medication use may differ from the directions in the MIB only with a veterinary prescription. In Québec, provincial regulation requires that all feed medication use must be prescribed by a veterinarian.

D5.2 Prescription Feeds

(On-Farm Quality Assessment Form question #10d)

Canadian laws require a veterinary feed prescription whenever:

- The dosage differs from the dose listed in the MIB
- The medication is used at a different stage of production than specified or used in a different species than that for which it is listed in the MIB
- The product is used for a different purpose than listed in the MIB
- The medication is used in combination with another medication not listed in the MIB
- Feed medications are used in Québec

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- Prescription feeds must be manufactured according to the directions of the prescribing veterinarian.
- Prescription feeds are for a limited time period, a specific number of animals and a diagnosed condition.
- Feed mills must have a copy of the prescription on hand prior to delivery of the prescription feed.
- Feed mills must not accept a prescription for a greater amount of feed than the animals would normally consume in the time period defined by the prescription.
- Feed mill operators must ensure that all medications used, whether in a prescription feed or not, have a Canadian DIN.

The written prescriptions for prescription feeds must contain the following information:

- Date prescription written
- Name & address of client
- Name and level of medication
- Name and amount of medicated feed
- Special manufacturing instructions
- Feeding directions including the number and type of animals to receive the medication
- Caution and Warning statements if applicable
- Signature of veterinarian
- Client signature indicating an understanding of prescription (optional)

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Feed mills must keep copies of customer formulas for at least six months following the last time that the feed is manufactured.

Feed mills must keep copies of veterinary formulas (requiring a prescription) for at least one year following the last time that the feed is manufactured.

It is also recommended that producers keep copies of medicated feed prescriptions on their farm. Producers are responsible for checking the tags and bills for every load delivered to ensure that medication and the level at which it is included are correct. To avoid mix-ups, a staff member must ensure feed-truck drivers delivering medicated feed in bulk form know which bin to put it in, that delivery slips are kept and that staff watches for places where errors could arise.

Prescription feeds must be tagged with the following information:

- Name and address of manufacturer
- Name of person for whom feed was made
- Name of veterinarian issuing prescription
- Name of feed and name and amount of medicating ingredients
- Directions for use
- Warning and Caution statements if applicable
- Weight of feed

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D5.3 Feed Mixing and Delivery

Ensuring proper dosages are delivered to the targeted pigs takes planning and equipment that functions properly. Mill calibration is the first step to ensure the desired amount of each feed ingredient is in the finished feed. The order that ingredients are added and the

amount of mixing time used affects how uniformly ingredients are distributed throughout the finished feed. Checklists, proper staff training, and electronic or manual safeguards that protect against inadvertently sending medicated feed to the wrong bin or feed delivery system help guard against human error. Periodic feed tests assure that proper levels are being delivered.

Most decisions about whether or not to add a particular type of feed medication will be made through consultation with the herd's veterinarian. It is good management to sit down once or more each year to discuss the rationale for using feed medication of any kind. When discussing medication use, consider things like pulse medicating and the pros and cons of using non-granulated and granulated feed medications.

Concerns related to feed mixing and delivery extend beyond cross-contamination by medications. Producers must remember that improperly stored feeds and feed ingredients may become contaminated by feces from animals and birds that may introduce pathogenic organisms or may become a prime area for the growth of molds and fungi. Storage areas must be maintained to ensure that feedstuffs do not become contaminated with these hazards. Likewise, feed mixing and distribution equipment must be properly maintained and routinely inspected to avoid cross-contamination by medicated feeds as well as by biological hazards.

D5.3.1 On-Farm Mixing

On-farm mixing presents a special challenge. It demands careful attention to develop special protocols to prevent contamination. Safeguards include procedures like sequencing so that non-medicated finishing feeds are made first. Following medicated feeds with the mixing of feed for the sows and growers is essential. These animals are less likely to go to a processing plant in the near future.

It is recommended to flush the system following the mixing of a medicated ration. The grain used to flush the mill should be sent to a separate bin and used later in a ration containing the same medication or in a sow or grower ration. If the feed mill is not flushed, rations must be properly sequenced to avoid cross-contamination concerns for rations fed to pigs going to market.

Clearly marked bins and augers make mistakes less likely. Written records must show: the type and amount of feed made, the type of medication added, the dosage at which the medication is added and who mixed the feed. If the same person mixes feed using the same mixing and sequencing protocol each time feed is made, the protocol should be clearly written out and all that needs to be recorded is the date. That situation changes as soon as there is a change in protocol.

The person who comes to validate your operation will review your protocols and records. Protocols will be recognized as the record of events unless a change occurs. All changes to regular protocol must be recorded.

- Keep records of feed mixing, sequencing and calibration of equipment. If feed mixing follows a fixed protocol, that protocol must be clearly documented. Indicate in your protocol the location where records are kept. (On-Farm Quality Assessment Form question #11)
- Staff responsible for mixing feed must be properly trained and understand the farm's protocols for handling, mixing, storing and delivery of feed and feed ingredients (On-Farm Quality Assessment Form question #11)
- Feed mills must be calibrated at least once per year according to manufacturer's directions. Record calibration either on the Feed Mixing and Sequencing Record or on a record of your own design. (On-Farm Quality Assessment Form question #11)
- Be certain to follow all applicable provincial regulations if you are mixing feed on your farm.

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- It is recommended that proportioner or volumetric mills be calibrated once per month or whenever a new grain shipment is being used. These mills operate on the assumption that every ingredient has a constant bulk density. If there is a change in grain being used or a new shipment of grain is being used, that bulk density may be different but the mill will still be set to add the same volume of ingredient. That same volume will not have the same weight if the bulk density has changed. (On-Farm Quality Assessment Form question #11)

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- Feed mill scales must be tested for accuracy upon installation and at least once per year after that (On-Farm Quality Assessment Form question #11)
- Your mill equipment supplier or feed mill representative may be able to calibrate your mill for you or may be able to verify your calibration records. Check with them to see if this is among their services.

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- Proper maintenance of equipment, including visual inspection and cleaning where possible will minimize the risk of cross-contamination by pathogenic organisms or medications.
- If adding ingredients by hand, consider making a list of ingredients for each ration and checking off each ingredient as it is added to help avoid adding the same ingredient twice or forgetting to add an ingredient (On-Farm Quality Assessment Form question #11)
- If adding ingredients by hand, you must have a system in place to accurately determine the weight or volume of each ingredient being added to the ration (On-Farm Quality Assessment Form question #11)

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- Producers must visually inspect processing equipment and processed feed to verify that equipment is operating as required. (On-Farm Quality Assessment Form question #11)
- Proper sequencing of batches minimizes the risk of contaminating non-medicated feeds with medications from other rations. (On-Farm Quality Assessment Form question #11)
  - One source of cross-contamination is electrostatic charge which causes medication to cling to the inside of the mill
  - Medicated feed remaining in the mill or in auger or blower pipes may also contaminate non-medicated feeds. For example, a vertical screw mixer may contain 20 kg of residual feed following discharge of feed
  - You must sequence your feed to avoid mixing non-medicated finisher rations immediately following a medicated ration. If you do not have a set protocol for mixing feed on your farm, ensure that you check the Feed Mixing and Sequencing record prior to the beginning of mixing. If the last ration that was mixed was medicated and a finisher ration must be made, you must first either flush the mill or mix another ration.
  - If you must mix a finisher ration following a medicated feed, flush your mill with grain first. If you choose to do this, be prepared to store the grain in an identified bin.
  - If you mix rations for more than one species, don't forget to consider cross-contamination from other species. For example, you will risk contaminating layer or lactating dairy cow rations if you mix these following a medicated swine ration.

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- Feed mixing and sequencing records must be reviewed at least annually by someone other than the personnel responsible for mixing feed on-farm (verification). Record this verification on the record sheet or a verification record of your own design. (On-Farm Quality Assessment Form question #11d)
- Written procedures for the processing and distribution of feedstuffs must be reviewed annually or at any time that equipment or management changes. (On-Farm Quality Assessment Form question #11d)
- Observe staff members with responsibilities related to handling feedstuffs at least once per year to ensure that they are carrying out tasks as described in the protocols. Make

note of this observation as part of your verification record.
- In your protocols, identify the location where records are kept.
- Don't forget to record that these verification procedures have been carried out either by signing and dating the records themselves and indicating that the verification has been completed or, you may choose to create a separate verification record. If you create a separate record, remember that it must identify what was reviewed (i.e. a list of the records, observation of staff, etc.)
- Ensure that medicated feed ingredients are delivered to the proper location; inspect tags and delivery manifests upon receipt or within 48 hours and initial these documents to ensure that the correct product has been received.
- Create a plan to address any errors that may occur. This plan must include:
  - the identification of affected animals
  - how the feed in question should be handled
  - who this situation should be reported to and who should be contacted for consultation, if necessary
  - identification of the source of the error
  - a flush of the system, if necessary
  - a record of the incident and how it was corrected

(On-Farm Quality Assessment Form question #11d)

D5.3.2 Purchased Feeds

The purchase of complete feeds, premixes, supplements or other feed ingredients from commercial feed mills offers a different set of risks to be considered.

- Discuss with suppliers how they handle complete feed and feed ingredients to prevent contamination by pathogenic organisms, hazardous chemicals, medications and foreign materials. Determine whether they have a quality control program in place. This type of program may have been developed in-house or may be HACCP or ISO certification (On-Farm Quality Assessment Form question #6)
- It is highly recommended that you inspect a sample of delivered feed to ensure that you have received the correct feed (On-Farm Quality Assessment Form question #11)
- Be sure that all feed bins are clearly identified and provide that bin identifier to your feed mill (On-Farm Quality Assessment Form questions #7, 11)
- Producers must carefully check feed delivery slips and feed tags and initial within 48 hours of feed delivery (On-Farm Quality Assessment Form question #11)
- Confirm that feed has been delivered to the correct storage bin (On-Farm Quality Assessment Form question #11)
- It is recommended that you refuse to accept any bulk or bagged complete feed that comes without proper documentation
- Feed delivery slips must be maintained for at least one year (On-Farm Quality Assessment Form question #11)
- It is recommended that you draw a diagram of your facilities showing where your feed bins are located. Identify the bins on the diagram and provide it to your feed mill (On-Farm Quality Assessment Form questions #7, 11)
- Written procedures for the distribution of feedstuffs must be reviewed annually or at any time that equipment or management changes. (On-Farm Quality Assessment Form question #11)

D5.4 General

- If you are mixing medicated feed on your farm, you must be aware of the requirements set in place by the Canadian Food Inspection Agency related to this. These include, but are not limited to:
  - Master formulas (recipes) for rations must be kept for a period of two years from the last date of manufacture of a feed

  - Daily production logs must be kept for a minimum of two years (Feed Mixing and Sequencing Record)
  - Prescriptions for veterinary prescription feeds must be kept for one year
  - You must have a current version of the Medicated Ingredients Brochure on your farm (http://www.inspection.gc.ca/english/anima/feebet/mib/cmibe.shtml for information on how to order)
  - You must have a current version of the Feeds Act and Regulations (http://laws.justice.gc.ca./en/F-9/index.html for an online version)
  - You must have a copy of the SOR 97-362 Regulations amending the Health of Animals regulations (http://laws.justice.gc.ca./en/H-3.3/C.R.C.-c.296/129395.html#rid-129494)
  - Material Safety Data Sheets (MSDS) for medications must be available on the site
  - All incoming medicating ingredients must have an approved DIN or are covered by an Emergency Drug Release and/or an authorization of Sale for Experimental Purpose
  - The farm must have written procedures for the cleaning of equipment
- Create a list of rations that are used on your farm. For each medicated ration, you must indicate the name of the medication used, the number of kilograms of medication per 1000 kg of feed and the grams of active ingredient per tonne of feed and the withdrawal time. Ensure that all medications are being used according to label directions or, if applicable, according to prescription directions. (On-Farm Quality Assessment Form question #10)
  - If you are pulse medicating, be sure to identify those rations you are pulsing with medication as two different rations — one contains the medication and the other does not. You may identify the rations with different names or with number or letter designations (e.g. grower ration A and grower ration B).
- If you are unsure of when a medicated feed was first fed or if you are suspicious the wrong animals were exposed to the wrong feed, withhold them from slaughter pending the advice of your veterinarian (On-Farm Quality Assessment Form question #11)
- Whether mixing feed on farm or having complete rations delivered from a commercial feed mill, ensure that your delivery system is set up to deliver the correct ration to the correct animals. If your delivery system needs to be adjusted to ensure that the correct feed is directed to the correct animals, write out the protocols for doing this and ensure that pipes, switches, attachments, etc. are properly identified (On-Farm Quality Assessment Form question #7)
- It is recommended that you keep samples of incoming feeds and ingredients. If you choose to do this, it is recommended that you keep samples for a period of at least 6 months. (On-Farm Quality Assessment Form question #6)
- Store bagged medicated premixes separately from non-medicated premixes
- Do not store any chemicals such as fertilizers or insecticides in the feed storage area (On-Farm Quality Assessment Form question #5b)
- It is strongly recommended that feed bins and carts are covered to minimize the risk that cats, birds or rodents can access these (On-Farm Quality Assessment Form questions #5a, 30)

D5.5 Edible Residual Materials

Feed represents a significant input cost for hog producers. To defray some of these costs, producers may chose to feed edible residual materials (ERM).

Edible residual materials are those products that remain after, or are not used during the

processing, manufacturing, preparing, serving or sale of food. This refers to bakery waste, certain restaurant waste (not including meat or products that may have come into contact with raw meat products), cull french fries, potato chips or potatoes from a processing plant, dairy waste or any other waste edible material left over from any type of food processing. Tallow from a licensed rendering plant does not fall into this category as it has been processed according to strict guidelines.

Meat, meat products or any material that may have come into contact with raw meat may not be fed as edible residual material in Canada due to disease risk concerns.

Be aware that although *Trichinella,* the main biological hazard associated with ERM has been eliminated as a concern through the elimination of feeding waste meat products, biological hazards such as *Salmonella* may still be a concern. If you choose to feed ERM, ensure that you obtain it from a reputable supplier and follow handling procedures appropriate to the product. For more information on the proper handling of ERM, contact your regional CFIA veterinarian.

Producers who wish to feed ERM must have a permit from the Canadian Food Inspection Agency (CFIA) to do so. These permits are issued by the CFIA Regional Veterinarians. They are issued annually and must be in place if you are feeding ERM. Farms being validated for the CQA® program that are feeding ERM will be asked to produce this permit (CQA On-Farm Quality Assessment Form question #8).

D5.6 Feed Storage and Distribution

- Feedstuffs should be stored in such a way as to protect them from moisture and contamination from animals and birds or their feces.
- Feedstuffs must be stored separately from farm chemicals.
- Feed storage bins, blower pipes, augers and connectors must be regularly maintained to minimize the risk of cross-contamination from previously stored or distributed feeds or feed ingredients.
- Written protocols for the distribution of feedstuffs must be reviewed annually by an individual other than the person normally responsible for feed distribution (On-Farm Quality Assessment Form question #11d)
- Create a plan to follow in the event that something goes wrong in the distribution of feedstuffs. This plan must include:
  - the people who need to be notified of the error (management, consultants)
  - how the affected feed will be handled
  - how the affected animals will be identified and handled
  - where the error and steps taken to correct it must be recorded

Animal Nutrition Association of Canada. 1997. Good Manufacturing Practices for the Canadian Feed Industry. Animal Nutrition Association of Canada, Ottawa.

Canadian Food Inspection Agency. 2001. On Farm Feed Mill Inspection. Canadian Food Inspection Agency, Ottawa.

Cromwell, G., J. McKean. 1996. Feed Management to Prevent Drug Residue Problems in Pork. Pork Industry Handbook #86. Pork Industry Handbook, Purdue University Cooperative Extension Service, West Lafayette, Indiana.

Johnston, L., M. Hogberg, D. Mahan. 1994. Feed Processing for Swine. Pork Industry Handbook #71. Pork Industry Handbook, Purdue University Cooperative Extension Service, West Lafayette, Indiana.