

## GETTING MORE MILEAGE FROM PORK PRODUCTION

**Pork producers can use this protocol to get more benefit from their swine feeding and manure management approaches, while qualifying for carbon offsets under the Alberta Offset System**

Alberta has introduced first-of-its-kind legislation in North America that gives agricultural producers new ways to benefit from helping to reduce greenhouse gas emissions. The result is the Alberta Offset System, which includes a number of protocols producers can follow in order to earn carbon offsets from documented improvements to practice changes. These may be sold in the growing carbon offset market.

**Record keeping is critical.** To qualify for offsets, producers need to have excellent farm record-keeping practices for the periods both before and after they adopt emissions-reducing practice changes. This is critical not only to earn offsets, but to protect producers from liability if there is any challenge to the carbon offset credits they are claiming.

Alberta Agriculture and Rural Development (ARD) has developed a series of Protocol Summary documents to provide producers with a brief introduction to each of the protocols related to agriculture – including the one you are reading here on pork production. Producers interested in pursuing projects that meet the requirements of this protocol can get more information through the Website links and contact information provided at the end of this document.

### THE OPPORTUNITY FOR PRODUCERS

Today more than ever, pork production systems face higher expectations for efficient production and how manure is managed. The pork production protocol under the Alberta Offset System provides pork producers in Alberta with an opportunity to help strengthen their management approaches in these important areas, while allowing them to qualify for carbon offsets at the same time.



The protocol is designed to provide producers with strategies that can help improve swine feeding, improve the effectiveness of how manure can be used as a resource, and also reduce greenhouse gas emissions.

Producers are recognized and rewarded for this reduction by qualifying for carbon offsets, which they can use to earn some extra dollars in the emerging carbon offset marketplace. The protocol provides a technically competent framework to accomplish both types of goals: improved production and reduced emissions.

All protocols developed for the Alberta Offset System have a primary focus on reducing emissions. At the same time, a priority has been placed on developing ones that have strong additional value or co-benefits for improving efficiency, productivity, sustainability and other important aspects of a successful agricultural operation.

## FUNDAMENTALS OF THE PROTOCOL

The practice change options identified in this protocol are aimed specifically at several key targets that can influence greenhouse gas emissions on pork production operations.

**Reducing manure volume and N content.** One target is to reduce the volume and nitrogen (N) content of manure excreted by the pigs. This is accomplished by improving feed efficiency or by reducing the N content of the feed (measured as protein) by strategically reducing protein rations.

**Cutting down volume of volatile solids.** The second target is to reduce the volatile solids (Vs) content of the excreted manure before it is applied to land. Vs is the undigested organic portion of feed. When it's excreted in manure, microbes can break it down and convert it into methane, a key greenhouse gas contributor for agriculture. This can happen both during storage and during and after spreading. Producers can empty manure storages in the spring to remove Vs and avoid methane before peak methane-producing times in the warmer months of summer and fall.

**Optimizing crop uptake to limit nitrous oxide.** Producers can also spread manure in the spring, close to the time the crop needs N, to reduce the opportunity for manure N to be converted into nitrous oxide.

**Capturing Credits Back to 2002.** Producers may claim carbon offsets based on eligible practices adopted at any time between 2002 and the current year, as long as requirements such as having necessary records are met. However, this option will not be available after January 1, 2012 due to increased verification requirements.

## TWO MAIN APPROACHES

The pork protocol includes two primary strategy options and producers can choose to pursue one or both. They are designed to work well when pursued either individually or together, though obviously the amount and value of offsets is greater if producers pursue both activities.

Here are the fundamentals for each option.

### Innovative feeding of swine

**Feed efficiency is the focus.** The aim of this component of the protocol is for producers to customize their feeding practices in a way that improves feed efficiency. By doing this, the volume of manure is reduced and the composition of manure is improved so that is easier to manage, more effective as a nutrient source for land application and less of a contributor to greenhouse gas emissions.

**Producers have flexibility on specific options.** Producers have broad flexibility for how they want to change their feeding practices. In fact, the protocol extends beyond feeding strategies alone to include a range of husbandry practices. The important thing is an end result of higher feed efficiency – where there is less manure produced by each animal and the manure composition is changed so it has less volatile solids and less nitrogen.

**Examples that qualify.** The options available include these and others:

### **Direct feeding practice options:**

- **Split-sex feeding.** Approach used to increase the feed efficiency of finishing hogs, by tailoring diets separately for male and female animals. Because each sex has different optimal feeding requirements, adding this level of tailoring can result in strong feed efficiency gains. The process typically involves separating males and females prior to the animals populating a feeder barn.
- **Phase feeding.** Involves phasing down the crude protein component of finishing rations, as the animals' requirement for this is steadily reduced. Because sources of crude protein tend to be one of the more expensive feed ingredients, this results in a lower cost of finishing pigs to market weight.
- **Using wet/dry feeders.** Use of this type of feeder is linked to more optimal feed intake and overall better feed efficiency.
- **Additives to improve feed efficiency.** A full range of feed additives are eligible so long as the feed efficiency gains are measurable using the formulas provided in the protocol.

### **Indirect options:**

These are additional options known to support more optimal feeding behaviour that qualify as recognized practice changes under the protocol.

- Improved ventilation/temperature control in the barn
- Improved health status of the swine herd
- More efficient genetics

### Storing and spreading of swine manure

**Focus on best timing.** The aim of this component is to better manage the seasonal timing for storing and spreading manure, in a way that results in more favourable manure composition for land application and fewer emissions during both storage and spreading stages.

**Shifting more activity to spring.** Producers can accomplish this by changing their manure handling schedules so that more manure is emptied and spread in the spring rather than in the fall. This results in less conversion of volatile solids into methane during storage, and less emissions of nitrous oxide from the manure after spreading.

## KEY REQUIREMENTS

The key requirements and considerations for this protocol fall into two categories.

### General

All offset projects, including those using the pork production protocol, must meet three basic requirements:

- **Records proving 'before' and 'after' conditions** – Producers need appropriate records that show the relevant conditions on their operations both before and after the practice change is adopted. The new approach must represent clear practice change considered beyond “business as usual” or common industry practice.
- **Clear right to claim** – The producer selling carbon offsets needs to clearly show ownership of the offsets or the right to claim the offsets. In other words, they own the operation or have a legal agreement that gives them rights to offsets for that operation.

### Protocol-specific

In addition, key requirements of the pork production protocol include:

- **Minimum standards for eligible operation.** All farms qualifying for carbon offsets must be:
  - Currently feeding swine, whether they are farrow, farrow to wean, farrow to finish, nursery or feeder operations.
  - Currently storing liquid manure for a minimum of nine months.
  - Currently applying manure or custom applying manure to land at roughly the same rates in the “before” (baseline conditions) and “after” (project conditions) periods.
- **Farm data to show feed efficiency improvement** – The calculations used to measure the improvement in feed efficiency, and related estimate of reduction in greenhouse gas emissions, is the total weight of the pigs sold divided by the total weight of feed. Producers will need to collect and provide appropriate farm data to support this calculation. This includes farm data on feed intake, feed rations (including feed sales information), as well as number and weight of pigs at key stages.
- **Baseline conditions for feeding practices.** The protocol provides producers with two options for establishing their baseline or “before” project conditions. One option is to use a sector level performance standard that provides default diet formulations and feed intake. Or if the producer has good records in place, they can use their own actual farm data on diet formulations and feed intake by pig class.
- **Less animals does not count as emissions reduction.** Carbon offsets can not be generated from simply reducing the number of pigs raised or shutting down the operation. Comparisons between before and after project conditions are done on per unit weight of pig raised, to prevent variations in animal numbers from impacting the results.
- **Baseline conditions for storing and spreading.** The protocol establishes the baseline conditions for this component based on an industry standard derived from sector survey data. In 2002, over 75 percent of producers emptied their storages in the fall, which means they typically spread manure in the fall as well.
- **Flexibility for mid-year applications of manure.** Mid-year applications of manure are allowed, but the producer must provide evidence they

were applying manure at roughly the same rate in the baseline and project conditions.

## ADDITIONAL IMPORTANT NOTES

- A single project submitted by a producer may involve a number of sites and a variety of enterprises. It must include the barn where the pigs are raised and the facility where manure is stored in addition to the land where the liquid manure is spread.
- A producer may choose to implement only one component of the protocol – swine feeding and/or swine manure management. However they are still required to provide full information and calculations for the other component since the requirement to show emissions reductions is based on the overall feeding and manure picture combined. The baseline and project information would be the same for the components that had not changed in these calculations.
- If a farm has both solid and liquid swine manure systems, the feed for pig classes under liquid manure can be split out and factored into the protocol.

## LEARN MORE

Producers who are interested in pursuing projects that meet the requirements of the pork production protocol can access more information through the following website links:

**Alberta Agriculture and Rural Development – Climate Change:**  
[www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/cl11618](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cl11618)

**Alberta Environment – Climate Change:**  
[www.environment.alberta.ca/0923.html](http://www.environment.alberta.ca/0923.html)

**Climate Change Central – Carbon Offset Solutions:**  
[www.carbonoffsetsolutions.ca](http://www.carbonoffsetsolutions.ca)

These resources include background information, available Interpretive Guides on the protocol, as well as access to the complete Protocol Documents. Producers can also contact ARD directly at (780) 310-FARM (3276) or Toll Free at 1 (866) 882-7677.

***This document last updated: January, 2011***

*Disclaimer: The information provided in this document is intended as general guidance only, as a first step for agricultural producers considering projects for the Alberta Offset System protocols. Please consult the full Government of Alberta approved protocols and available Interpretive Guides for more complete information before making a decision to pursue practice change aimed at earning carbon offsets.*

## ACKNOWLEDGEMENT

Alberta Agriculture and Rural Development (ARD) is working on developing carbon offset opportunities in agriculture. This work is funded through the Agriculture and Agri-Food Canada (AAFC) AgriFlexibility fund.