

# Ingredient Sourcing by the Liquid Feeder

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## ■ Introduction

Liquid feeding programs are more common in Ontario than western Canada. These programs offer opportunities to establish a cost-effective feeding program, but also require a pro-active approach to managing the risk of ingredient variability.

## ■ The Evolution and Use of By-products and Liquid Feeding with the CFIA

We've been feeding by-products since 1986. In the beginning, we would get an occasional phone call from a CFIA veterinarian asking about the products we were feeding and we would both carry on. But more recently things have changed. The CFIA are no longer calling these a by-product or Edible Residual Material (ERM), but a Recycled Food Product (RFP). To know if the product you are thinking of using is CFIA approved you need to check Schedule IV and V of the Feeds Regulations. Some of the approved RFP are in Schedule IV, Part 1. If the RFP meets the packaging and labeling requirements of the regulations, it can be sold and used as a single ingredient for pig feed. But if there are any concerns with product safety or effectiveness, then the RFP must be registered with the CFIA and falls under Schedule IV, Part 2. Registration forms must be filled out and approval granted by the CFIA. I haven't been through that process but am aware of colleagues who have done it for a few products.

Interestingly, the regulations also say:

If an RFP is given away by any person or manufacturer it may be exempt from the requirements of the Feeds Act and Regulations, but only if the RFP is manufactured into feed on-farm and does not

contain any drugs or other substances that could adversely affect animal or human health or the environment.

This may help some manufacturers move the by-products they produce and may help the pig farmer get a feed ingredient by paying for trucking. The regulations go on to talk about what is not allowed, such as post consumer products and meat products, spoiled products, etc. It is now required of the manufacturer of the RFP to disclose all aspects of the manufacturing process that lead up to this final feed product. The aspects include ingredients, source of each ingredient, formulation range, safety data, and storage techniques. This is all the responsibility of the manufacturer so as a farmer you must get this information from the by-product source or you are feeding an illegal product. These regulations help sort out the manufacturers that may just want to move their product as garbage. The downside is that these regulations may drive up the costs of the by-products thereby making them unprofitable as a protein, energy, or mineral replacement.

The other evolution of liquid feeding with the CFIA is the use of medications in your feed. If you are using medications in your liquid feed, you need a prescription from a veterinarian. This is different from dry feed regulations because these medications were not tested in liquid feed when registered. We've worked with this regulation and if you and your feed company are organized, few problems will occur.

## ■ Sampling Guidelines

Sampling of ingredients doesn't sound like a big deal, but how to take a representative liquid feed sample is a hot topic. When you want to take a sample for your feed company, by-product supplier, the CFIA or yourself, you want to take a sample that provides an accurate and fair representation of the product. It's even more important for medicated feeds.

I don't have the answer to this question. I'm just letting you know that this discussion needs to happen when a sample is taken for any reason. Making decisions from inaccurate samples is worse than making no decision at all.

Getting a duplicate sample for your own records is a good idea so if the sample is lost or the sample results don't seem to be accurate you can get a retest done.

## ■ Advantages and Disadvantages of Alternative Feeds

**Advantage:** possibility of reducing your feed costs,

**Disadvantage:** risk of varied quality and consistency may reduce pig growth; more labour to manage more products; increased energy usage to pump and agitate; and more complex ration designs.

## Quality and Consistency is King

Before we talk about price or dollars in feed savings we have to go through quality control. No matter how cheap the product is, or how much feed cost savings there *might* be, if the product is below label dry matter or under/over processed so the product tastes different each time or has different nutritional makeup you will not reach the potential feed savings since the pigs will eat less and/or grow less. You may have been getting a product for years and not worry about checking dry matter. You've probably have had no problems, but some day you will wish you had taken even a few basic steps in keeping the source company accountable to providing a stable and consistent product.

## Quality Control Measures to use on the Farm (Some are Free)

- Is the colour consistent from past loads?
- Is the smell the same?
- Does it taste okay?
- Does it foam more or less then usual?
- For a liquid product, does the last 20 litres coming off the truck have the same amount and colour of solids?
- Use an electronic pH meter and test acidity instantly. (\$400 for a good tester. But keep it clean.)
- A slightly more involved test that you can do on-farm is dry matter. You can find a used oven and high accuracy scale on-line and check for yourself if the product is actually the right DM. (Cost about \$600).
- If any of the above tests shows signs of inconsistency then send a sample away to an accredited lab for results. When you get the results back, file them to build up your own bank of data to compare future results to hold the supplier accountable.

## ■ **Mixing Liquid Ingredients in Storage Tanks and Mix Tanks**

This is one of those little things that is easily missed and becomes important very fast. Unless you really look for it you could be providing inadequate mixing.

Here are some things to look for:

- Varied amounts of solids on bottom of storage tank when it goes empty,
- Change in colour of product in storage tank as it empties,
- Oil/fat component of by-products floating on top of the mix,
- Take sample of product from storage tank or mix tank from first out and then again from last out. Put them side by side and look for different amount of solids settling on the bottom.
- Send samples of first out and last out to the lab to be tested for DM, protein, fat and minerals (phosphorous, sodium, potassium) levels or any other indicator you may want.

Storage tank agitation can be easy or hard to provide depending on your product and your storage vessel. The best agitation is done with mixing paddles. This can be difficult but not impossible in certain vessels.

High speed jet streams work but watch for solids being deposited on the furthest away corners. Slow jet streams along the bottom which causes the tank contents to turn slowly works well for slow settling solids like corn distillers solubles or whey.

## ■ **Understand the Risks of your Co-Product**

When you are deciding to use a product, you must weigh the cost advantage of the product (worst and best case scenario) with the risks of using the product. A stable whey or dry product may have low risks and be easy to handle and feed but a product that needs to be fermented or settles easily or changes in DM often needs to have a risk "de-value" attached to it. Everyone has their own tolerance to risk so this is an individual calculation that I've found to be very different when I talk to other farmers using alternative feeds. Including products in your rations and not assessing any risk value to them is naive.

## ■ Two Common Ingredients: DDGS and CDS

Dried distillers' grains plus solubles (DDGS) and corn distillers' solubles (CDS) are available due to the dry milling ethanol industry. Both are good products that can reduce your feed cost per pig if managed right.

### **Dried Distillers' Grains (DDGS)**

This is dry product so anyone can put it in their feed. The important thing to remember is that it is dried at the plant. Drying can be done right or not so right. In general, you want the DDGS you feed to your pigs to be golden in colour. This indicates the drying process didn't burn the product and thus the taste is good and the amino acids are all intact. I would suggest a maximum inclusion rate of 20%.

### **Corn Distillers' Solubles (CDS)**

CDS is a liquid product and thus only usable by systems that can handle it. Keeping tabs on dry matter is important here as with any liquid product. Some plants can deliver a specified dry matter that matches your system. Agitation is important with this product as it slowly settles out and oil separates and you can end up feeding varied amounts of fat and dry matter as the tank empties. This product is high in fat and phosphorus but the protein is of low quality so it needs to be managed with this in mind. Maximum inclusion rate of 10%.

## ■ Feed Conversion - Knowing it is a Must

### **How We Improved our Feed Costs**

When we started liquid feeding in 1986 we had our fill of whey. With lots of whey, all we wanted to do was feed pigs cheap with little concern for feed conversion. We designed our system around this abundant product. When we no longer had access to this cheap feed source we had to change our mindset. We tried other products like DDGS, corn steep water and CDS, but all of these didn't quite work since we didn't know then what we know now about their characteristics. When we used a corn/soy diet our feed costs went way up. Slowly we realized that we had to change our focus from growth to feed conversion. That wasn't easy because for many years our goal was growth. Now we started focusing on low feed conversion and 800 to 900 grams per day growth in the finishing barn. We started with a Feed Conversion that was higher than 3 in our finishing barns and have worked our way back to the present level of 2.5 – 2.6. How did we do that? The first key was trough management. We manage the trough so it is empty to almost dry,

between feedings. Sounds easy but you have to stay at it for every trough every day.

The second more complex thing we did was ration design. We produce our own gilts and boars so our genetics are unique and so our rations had to be unique. We added fat to our diet to see what our pigs would do with this extra energy. After some trials we found that it added efficient gain. So we wondered what extra protein would do. We bumped up the soybean meal and got more efficient gain. What we want to do is meet the growth potential of our pigs. And the only way to do that is to measure feed intake and growth and follow trials through both successes and mistakes to perfect your own best feed ration for your facility.

### **Calculate Your Feed Conversion with Dry or Liquid Feed.**

To calculate your own growth and feed conversion only two things are needed - to measure the feed going to each pen and the weight gain of the pigs in that pen. Simple.

Doing weights while the pigs are in the barn - about every 2 weeks - gives you data that you can turn into information since you can improve things and see changes as they pigs move from 25 kg through to market. Over this time period you will have the opportunity to see growth and feed conversion about 6 times.

The following are ways to measure feed conversion whether you are a wet or dry feeder.

#### ***Dry feeders first:***

- Simple basic feed cart with a scoop and basic pig scale. Once you know the weight of the scoop when it's full you keep a record of the number of scoops that go into the feeder and weigh either all the pigs in that pen every 2 weeks or weigh a percentage of the pigs in the pen. Of course the more pigs in the test the better but keep the work doable or it won't get done.
- Hanging feed scale over a test pen that tracks feed going into the feeder and a pig scale. This hanging hopper trips at a determined weight and counts the number of times it has tripped. Sounds simple enough. The pigs can be weighed on a single pig scale or even better a group scale out in the hallway or feed room/shipping area. The group scale makes things easier on the person and the pigs by reducing the stress level for both. Use hanging weigh bars to keep electronics away from mice and manure.
- Use a sentinel scale in a larger group pen to daily calculate average weight of the pigs. This is a new concept for pigs but has worked well in

chicken and turkey barns. I've no experience with it but it seems worth a try. The feed delivered can be measured with a meter on the flex auger that calculates the feed used by multiplying the time the auger runs by the kg of feed delivered per minute of run time.

- Computerized dry feeding that automatically stores data from individual feeders.

### ***Liquid feed:***

The use of a feeding computer simplifies the data collection of the amount of feed delivered to the pigs. The computer measures and stores this data, so all we have to do is manage the data. Weighing the pigs is now the only real challenge but the reward is worth it.

## ■ **Swine Liquid Feeding Association**

The Swine Liquid Feeding Association (SLFA) was formed in 2001 by a group of pork industry stakeholders to promote liquid feeding technology and research within the Ontario pork industry. The directors of the SLFA represent a cross-section of pork producers and industry personnel. The current executive consists of thirteen directors, seven pork producers and six industry representatives that have a keen interest in liquid feeding. The mandate of the SLFA is to facilitate the transfer of current information and future developments in swine liquid feeding technology to those interested in pork production. For more information and for results of the research barn trials conducted at the University of Guelph, visit our website - [www.slfa.ca](http://www.slfa.ca)

## ■ **Conclusion**

Liquid feedings programs may offer opportunities to reduce feed costs, but require attention to:

- federal guidelines for ingredients sourcing,
- ingredient variability, and
- monitoring growth and economic performance of the herd.