How to Conduct On-Farm Swine Feed Trials

THURSDAY, 16 NOVEMBER 2017 BY GILBERT VANDENHEUVEL

DWYER MANUFACTURING LTD.
www.dwyermfg.com
P: 519-527-2285 / F: 519-527-2562
43709 Summerhill Road, Dublin, ON

November 16. 2017

Written by Gilbert VandenHeuvel

How To Conduct On-Farm Swine Feed Trials

Introduction

A fact that we know all too well is: Feed is the single highest cost to grow a pig from weaning to market weights. Those who can make each feed dollar count will be more successful then those that don't. Dwyer Manufacturing succeeds when you succeed. Feel free to contact us to design solutions to help you weigh your pigs and/or feed. If you need a simple pig scale or a central group weighing platform, we can get it done.

Remember that even a small improvement in feed conversion or average daily gain will quickly pay for the time and equipment needed to conduct an accurate feed trial.

Reasons to do an on-farm trial:

- qualify that university or feed company product claims work on your farm with your pigs.
- evaluate specific genetics
- test different equipment on your farm
- test different feed components or ration design
- generate a cost of production for your farm (this isn't necessarily a feed trial, but it should have the same methodology)

No information is better then the wrong information.

Attention to detail is vital when conducting a feed trial. If it's done carelessly, there is a high probability that the information generated will be misleading. Decisions made from the wrong information will probably be wrong thus costing you more money then if you didn't change anything at all.

The key to conducting a meaningful trial is to:

1. minimize differences in pig performance that could be caused by factors other than the feed

2. provide a sound basis for ensuring that the results are reputable and valid for use

3. compare only two differences at once.

The most practical feed trials are those conducted on grower and finisher pigs. Trials done in the sow barn are difficult to keep statistically accurate since larger numbers of sows need to be in the trial and all these sows need to be similar in genetics, parity and housing conditions.

Trial Procedures

1. **Weigh pigs and Feed**. A reliable method of weighing pigs in and out and weighing feed is a must. The pig scale can be a single animal scale or a gro

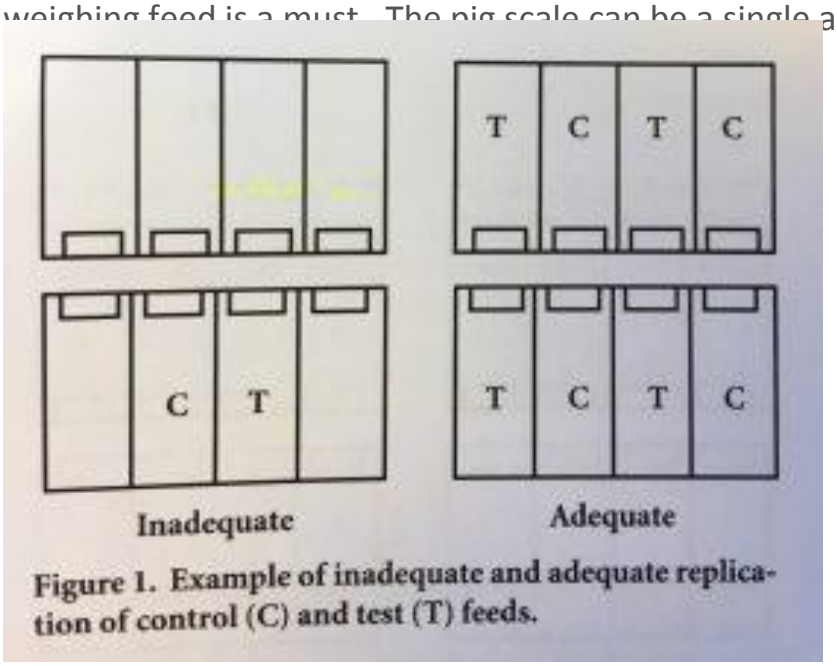

Figure 1. Example of inadequate and adequate replication of control (C) and test (T) feeds.

up scale, both will work fine. It's been my experience that an electronic group scale in a central location works the best. Once the pigs use it once, they will move easily towards it and they seem to enjoy the activity. Feed weighing can be more difficult. Computerized liquid or dry delivery system is the best way but a feed volume counter can be installed above test pens or feed can be delivered in bags or weighed feed carts. Let me repeat, if the pigs and feed are not weighed accurately then there is little sense in spending the time and effort of the trial. Find a system that works in your facility and get the trial going. If an animal needs to be pulled from the trial due to illness or dies, weigh it so the data can be adjusted and remain statistically

correct. At the end of the trial, remember to subtract any feed left in the feeders from the total feed usage number.

2. **Understand and Manage Variability or Chance Variation**. No matter how well you sort the two test groups to be alike there will always be a difference in their growth performance that you can't anticipate or control. This can range from genetics to illness to mechanical issues. Scientists will talk about coefficient of variation with this issue which get complicated quickly. For a barn trial, take care to limit variation among the test groups and repeat the trial 2 or 3 times to minimize the effect of variation on the results.
3. **Have Adequate Replication**. Having only one pen of pigs per feed type in a trial may cause misleading results. Replication is important to minimize mistakes and ensure correct conclusions. If the number of pens per feed type requirements cannot be met at one time, repeat the trial over time using successive groups of pigs. Be sure to have the same number of pens

available for each feed type during each time period.

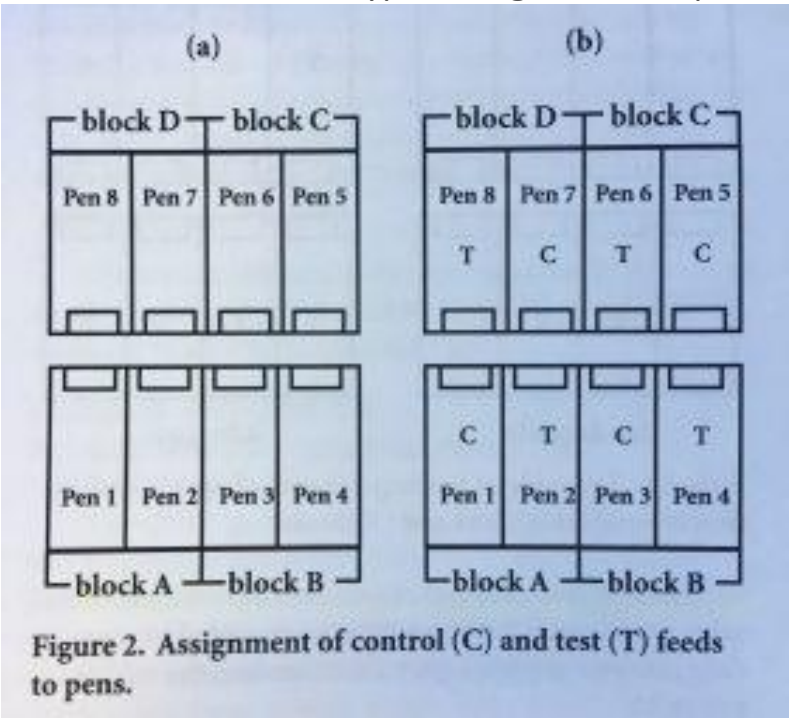

Figure 2. Assignment of control (C) and test (T) feeds to pens.

4. **Select the Proper Pens**. All the pens used in a trial must be the same size with the same environmental conditions, feeders and water supply system. Keep in mind when selecting the pens to be used that the location will not influence the trial results. Figure 2 demonstrates a reasonable pen selection.
5. **Minimize Pig Weight, Ancestry and Gender Effects**. Pigs perform differently because of their weight, ancestry and Gender. These effects must be equalized across all feed types in the trial. The number of barrows does not need to be the same as the number of gilts in a given pen; however, the ratio of barrows to gilts and total number of pigs must be the same in each pen. All pigs should be randomly assigned to pens to ensure

the integrity of the experiment. Starting weight of each group should be within 5% of each other to be considered similar. If this is not the case then pigs need to relocated to bring this difference within 2%. In addition, it's important to minimize weight variation within pens as much as possible.

6.

Side Note: If a pig dies during the trial, data collected from the dead pig's pen must be adjusted. To adjust on-test en weight, subtract the dead pig's on-test weight from the pen total. Adjust pen feed intake data by determining average daily feed intake per pig for the period the dead pig was alive. Multiply by 0.75 to estimate daily feed intake for the dead pig. Calculate total feed consumed by the dead pig since the onset of the trial and subtract from the total feed consumed by the pigs in the pen.

Select Suitable Test Animals. It is not unusual that a pig dies during a trial, so it's important to screen the test animals before the trial to eliminate any pigs showing signs of sickness so not to alter the results. All the pigs in the trial should share similar background. For example, they should have eaten the same type of feed, received the same vaccines and housed in the same

type of barn. If pigs with dissimilar backgrounds must be used, be sure to balance these pigs on each side of the trial.

7. **Test Feeds Concurrently**. Pigs fed the control and test feeds must begin the trial on the same day. If this doesn't happen, then there is one more variable in the trial which could negatively impact the trial results.
8. **Determine Trial Duration**. The feed trial should be long enough to reasonably collect enough data but not so long as to give other factors a chance to influence the results.
9. **Tabulate Results and Draw Conclusions**. Calculate pen averages for each of the variables in the trial, such as daily gain, feed intake, feed conversion and feed cost per kg gain. Table 3 shows results that most conclude that the test feed was better. This is not necessarily true. Let me explain why. Back in Point 2, Chance Variation was explained. With results that are this close there is a significant chance that unforeseen differences could have altered the results this amount. Results this close could have been skewed by a mixture of other factors other then feed; such as health, weighing inaccuracy and genetics. The best next step would be to repeat the trial and average the results for a more conclusive outcome.

Table 3. Example average daily gain results from a nursery pig feed trial

	Feed: Control		Feed: Test	
Block	Pen #	Daily Gain, lb	Pen #	Daily Gain, lb
A	1	0.79	2	0.83
B	3	0.83	4	0.8
C	5	0.83	6	0.88
D	7	0.79	8	0.86
	Average	0.81	Average	0.84

Summery

On-farm trials involve a lot of time, effort and dedication but designed properly they help you make sound business decisions. As an added incentive, certain types of scientific research that you do to improve your business may qualify for the Canada Revenue Agency's Scientific Research and Experimental Development (SR&ED) tax incentive (www.cra-arc.gc.ca/sred/) making on-farm trials well worth the investment.

Thanks to the University of Nebraska and Ontario Ministry of Agriculture and Food as resources. To read complete paper from University of Nebraska CLICK HERE OMAF paper HERE