Loss of Growth and Cost Estimation Method

General Description

Feed intake is measured using auger run time, and distilled into daily feed use in relative terms. After discarding evidently erroneous readings (due to data logging errors or auger blockage), a fit to best values is derived.
Best values are taken as the highest readings within any short term period, representing the potential feed intake. (Noting that erroneous or questionable values have been already discarded.)
The curve to best values is therefore taken as the normal potential feed intake pattern over the period. Actual values are then compared to the curve, and deviation is calculated as a percentage.
Using an assumed value for normal Times Maintenance, the deviation is converted to a fractional loss of day's growth. Accumulated loss of day's growth are accumulated in to Extra Days To Finish. This is converted into a $ value based on 1M of feed at final weight.

Method

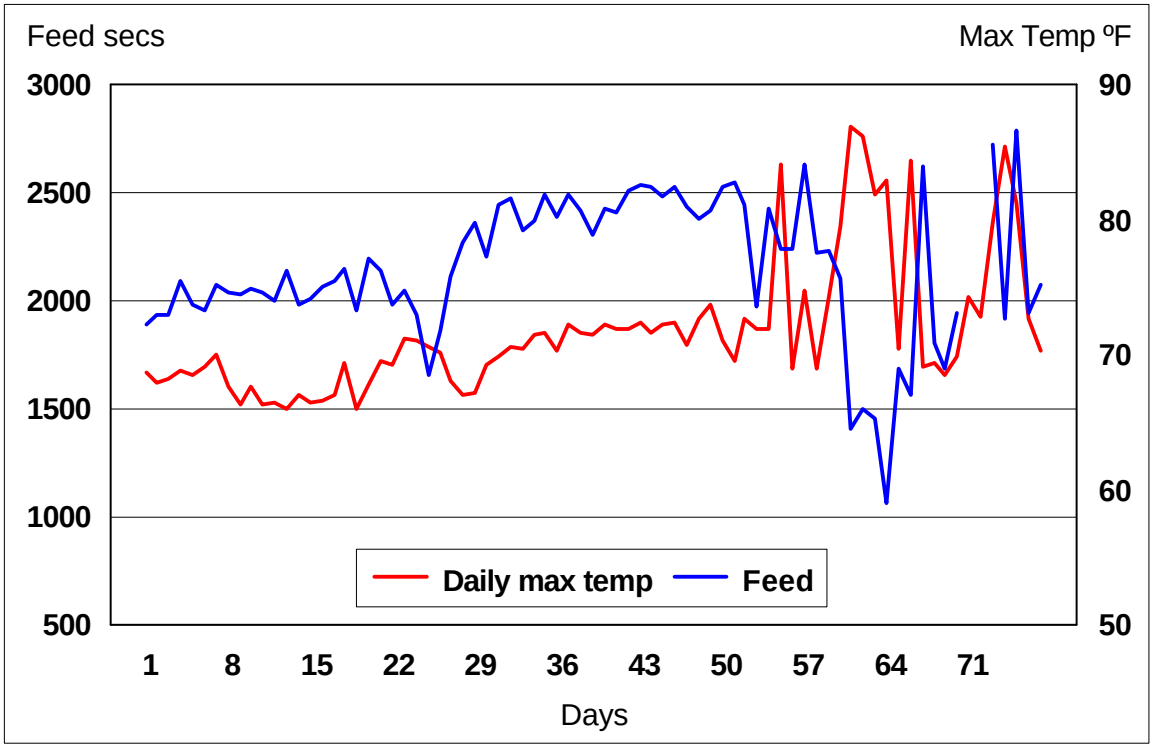
1. A daily summary of feed auger use is exported from Barn Report (using the Define Batch function) and imported to a spreadsheet for semi manual processing.
2. Visual checks are made on the data, which is then filtered to remove erroneous or questionable values.
3. A rolling curve of best fit (RCBF) to highest certain values is generated, with available adjustment to discount individual peaks.
4. Each day's reading is compared to the curve and the error estimated in percentage terms.
5. Percentage error is converted to relative loss of day's growth (RLDG) using assumed xM value. (See example.)
6. RLDGs are accumulated into Extra Days To Finish (EDTF).
7. EDTF converted into extra feed and additional cost / loss of potential using notional values for 1M feed and feed cost/ton.

Example

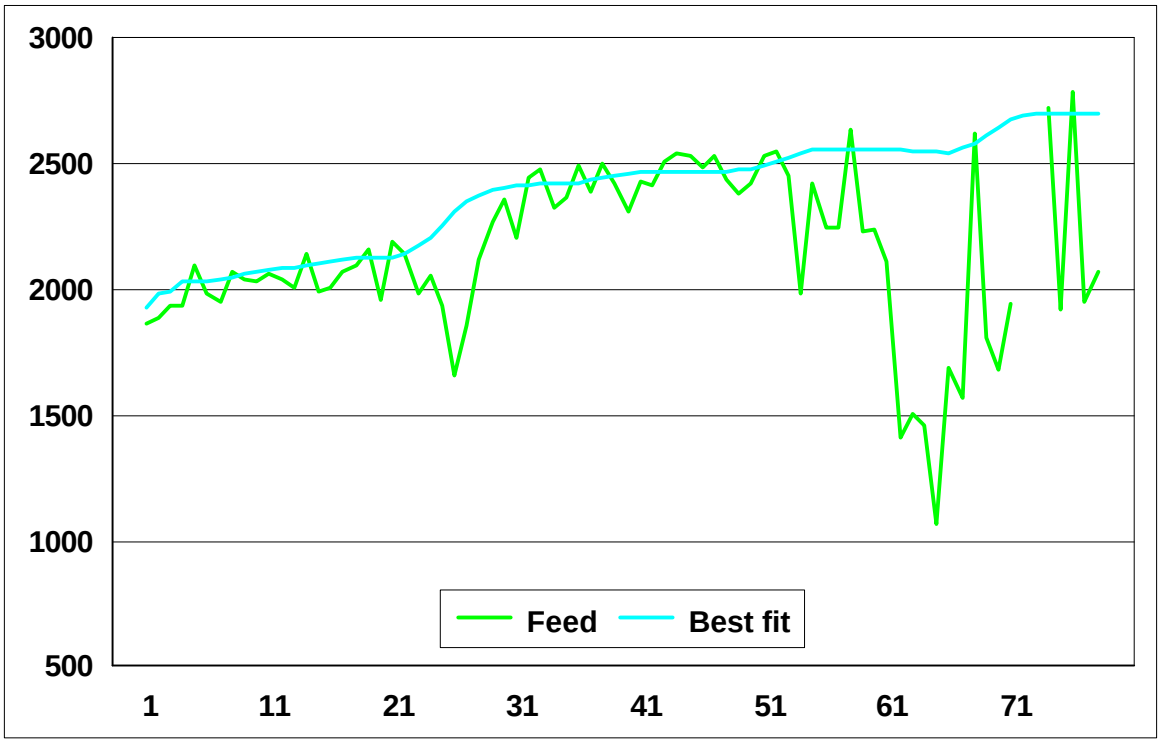
RCBF value = 2000 secs
Actual = 1800 secs
% Error = 1 - 1800/2000 = 10%
Assumed xM = 1.5 (example)
Deviation = 10% (0.1)
RDLG = 0.1 / (1.5 - 1) = 0.3 days

EDTF = sum of RDLG = e.g. 4.2
Assumed 1M = 5 lbs (example)
Extra feed/pig = 4.2 x 5 = 21 lbs
Number of pigs = 950 (example)
Assumed Cost = $160 /ton
Loss of potential = 21 x 160 / 2000 = $1.68 per pig
Overall loss = 950 x $1.68 = $1596

Example data

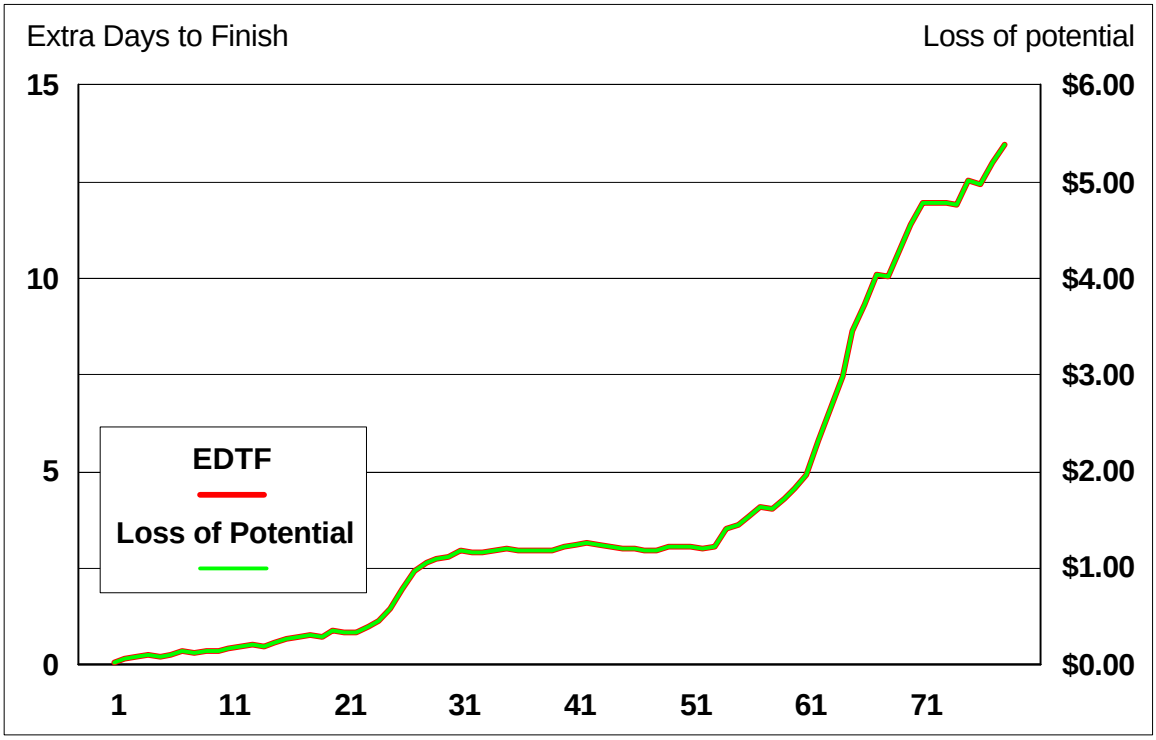


This chart shows an example of the type of variable that may have a significant impact on feed intake. This may not have been the only variable affecting intake, but gives sufficient indication to suggest that, without inhibiting factors, a best fit curve would be valid.



Calculating the loss of growth based on a normal intake over this period of 1.5M, we can derive an EDTF (Extra Days to Finish) of 13.4. The following charts shows how this develops over the period, and also how it translates to loss of potential profit.

The loss of potential profit is calculated only on feed costs, and makes no allowance for labour, building capitalisation or running costs. It would be relatively straightforward to add these to the calculation.



No allowance or estimate has been made for loss of intake/growth for days on which the data has been discarded.
Accordingly, the EDTF and LoP figures are liable to be an under-estimate.

Assumptions

1 That feed auger use is a true reflection of intake, and auger throughput is constant in weight delivered per second.
2 That Maintenance is a constant for a particular size of pig at a certain time, and feed is always used for maintenance before growth.
3 That growth is directly related to margin over maintenance. For example, suppose normal feed intake was 1.4 and the pig would have put on 2 lbs, if intake is reduced to 1.3 (a reduction of 7%), then growth would be 1.5 lbs, a loss in growth of 25%, or 0.25 days loss of growth potential.
4 Correspondingly, that extra feed will be converted.

Discussion

Quite reasonably, one might criticise some of the numbers used, and all or any of the assumptions.

This method compares a batch of pigs with itself, somewhat in the absence of any absolutes to work from. So, for example, loss of potential can only be estimated if the actual potential is revealed at least for part of the time.

However, I believe the method has some potential benefits, not least that it is cost effective and can work from limited data. One of the most useful aspects is that it helps to reveal step changes in the relationships. It helps to focus - in economic terms - on particular issues and situations.