How much can we expect from x-ray fat analysis?

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X-ray solutions may look similar, but seemingly small differences in terms of accuracy can make a big difference to the payback time.

After its introduction to the meat industry in 2003, x-ray analysis has gradually gained acceptance as a profitable and practical way to control fat content in all sorts of meat products.

To help meat producers make the right choice when acquiring this still relatively new technology, this article explains how just a slight improvement in measurement accuracy can yield thousands of dollars or euros per day.

0.2% improvement

Users of the high performance x-ray analyser, the Foss MeatMaster II, have found it to be at least 0.2-0.3% more accurate than alternative in-line analytical solutions. In most cases the difference is even higher.

Now 0.2-0.3% may not sound like much of a difference, but it can result in a huge boost in value for the company using it. This can

be explained using two different production plants as examples.

At the first, the production manager has a fat specification of maximum 20% fat in the products. He obviously wants to get as close to this as possible and to help him, he is using an analytical method with an error of 0.8%. This margin of error gives him a certain variation over time (Fig. 1).

It gives him a distribution curve like Fig. 2 where he has set the fat point to 18.4% to make sure he does not go over the target 20%.

The set point is calculated by multiplying the 0.8% error with a recommended

standard deviation interval of two. 0.8% times two equals 1.6%, subtracted from 20% gives a set point of 18.4%.

He is pretty happy with this. After all, the standard deviation needs to be there and the analytical error of 0.8% is pretty good. But what if the analytical error could be reduced even more? In our other example, the production manager has got his analytical error down to 0.6%. His fat content does not vary so much (Fig. 3).

This gives him a distribution curve like the one in Fig. 4. Here the calculation is 0.6% times two which equals 1.2%. Subtracted from 20% this gives a fat set point of 18.8% compared to the first one of 18.4%.

In this example, the production manager can use more fat in his burgers with confidence that he will still be on target.

The price difference between the fat and the leaner raw material has been around €1.00 per kilo and he produces 25 tons of burgers daily. He has therefore been saving around €1000 per day on raw material costs. Over 300 working days he has made €300,000 per year in extra income.
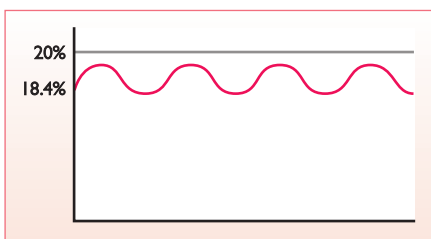
Fat analysis

MeatMaster II offers a leading accuracy for fat analysis down to 0.5% depending on user situations. This exceptional accuracy offers a rapid return on investment.

The MeatMaster II system can scan up to 38 tons per hour of fresh, frozen or packed meat and determine fat content and weight with high accuracy, while also spotting foreign objects. ∎
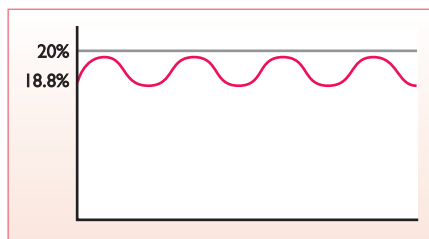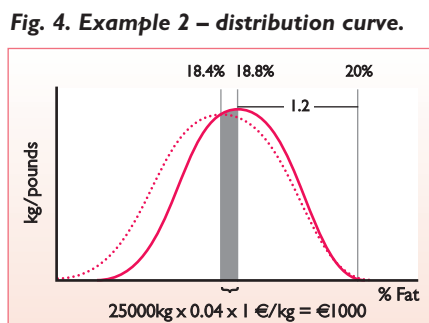

Fig. 1. Example 1 – variation over time.

Fig. 3. Example 2 – variation over time.
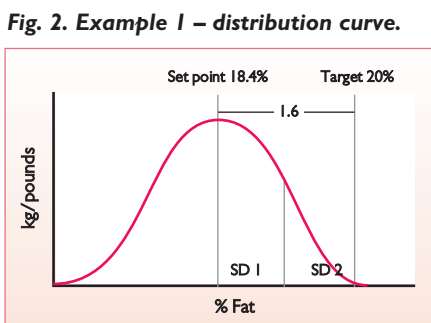
Fig. 2. Example 1 – distribution curve.

Fig. 4. Example 2 – distribution curve.