4:23 Increase of profitability in the meat industry by means of quality cost analysis

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Introduction

Companies are managed to a great extent with the aid of results from accounting systems. These systems have weaknesses that can lead to erroneous decisions in certain situations.

Accounting systems are not adapted to give attention to the various quality costs. For example, when in sausage manufacture quality defects occur more or less frequently, these products may not be sold, being classified as "internal returns". Usually, these returns are bought back by the department which makes the sausage mix. The price on internal returns is usually less than the average price on original sausage mix. The result is that an increasing amount of quality defects makes the sausage mixing department more profitable. Neither does the accounting system show how much greater the saving would have been if the amount of returns had been lower for the company as a whole. At the same time no information is given in the accounting systems regarding which products or which failures cause the largest quantity of returns. Clearly the present system does not encourage good manufacturing practice or the reduction of wastage by economic incentives.

This example describes one of many effects that the accounting systems have on quality. Quality cost analysis is an excellent method of improving the profitability of the company as a whole. In a survey by VEEN (1) it was shown that quality costs were 7-12% of the turnover of the food industry.

Quality costs - a definition

The concepts of quality cost are not new. JURAN et al (2) define quality costs as follows:

Prevention costs:	Costs for actions aimed at minimizing appraisal costs, internal failure costs and external failure costs (for example, costs for product specifications, working instructions.
Appraisal costs:	Costs for supervision and inspection (for example, cost of analysis).
Internal failure costs:	Costs which arise when defective products are produced and detected before delivery (for example, costs for reworking, cost for condemned products).
External failure costs:	Costs which arise when defective products are delivered to customers outside the company (for example, cost for returned products).

SANDHOLM (3), for instance, has shown that by increasing prevention costs the total quality costs will decrease. Total quality costs will decrease due to a decreasing amount of defects in production.

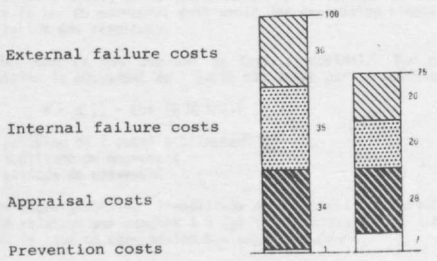

Figure 1. The total quality costs will decrease through investment in preventative measures.

Methods for measuring quality costs

A problem that arises when quality cost analyses are initiated is how to evaluate the different costs. For example how to evaluate the returns which are described in the opening example. One way is to take the difference between internal prices. For example, if a product is returned from the packaging department to the manufacturing department, the internal failure cost would be the price of the unpacked product reduced by the price of the sausage mix. This is not always clear, neither is it always possible. In these cases it is necessary to make a relevant estimation of the quality costs.

When quality costs are being measured it is essential to take note of the type of product, type of failure and cause of failure. If different lines are producing the same product it is also useful to take note of at which time which batch was produced.

After the quality costs have been calculated, they may be plotted in diagrams as shown in figure 2. A short look at the diagram is enough to see which failure costs are the "essential few" and have the largest economic potential through prevention.

The presentation of failure costs also makes it easier to follow changes in these costs due to improvements in processing.

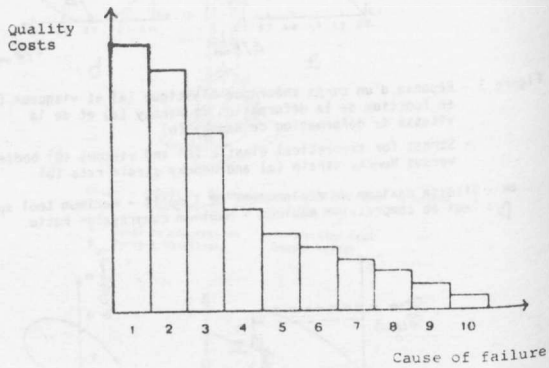

Figure 2. Quality cost per cause of failure.

Quality costs can be measured either by collecting data continuously or by a "one shot" study.

The quality costs presented in this paper have been obtained both by continuous measuring and "one shot" studies.

Quality costs in the meat industry

Slaughter-line

At one slaughterhouse the one shot method was used. The slaughterhouse is very modern and is EEC approved. Data was available on; hide injuries, slaughter injuries and some minor types of injuries.

Statistics on hide injuries were obtained from an external purchaser. Statistics were presented both as the percentage of hides in different quality groups and as the percentage of hides having certain types of injuries. The price reduction for poor quality depends on the group in which a hide is classified. The amounts of the price reductions used are 0%, 10%, 25%, or 50% and above.

Slaughter injuries were measured internally when carcasses were transferred to the cutting department. Each type of slaughter injury causes a price reduction. The size of the price reduction is based on the loss a specific injury causes in the cutting department.

Meat processing plant

In the meat processing plant data on vacuum leakage and product waste was collected continuously and expressed as the percentage per kg of produced product. These data were supplemented with the costs of handling, transportation etc. which are so incurred.

Here the basic facts were available but the problem lay in evaluating the cost. As a basic principle the difference in internal product price, between the two stages of manufacture, was calculated. The advantages in using this system are that it is easy to understand, easy to handle and easy to get acceptance for from production personnel.

Results

Slaughter-line

Quality costs on beef were calculated for:

hide injuries	£ 0.012/kg slaughter
slaughter injuries	£ 0.006/kg slaughter
other injuries	£ 0.004/kg slaughter

Before any conclusions could be drawn it was necessary to analyse the figures more closely. In the statistics hide injuries consisted of grain, slaughter and other injuries. Slaughter injuries to hides originated directly in the slaughterhouse but a section of the grain injuries did not. This section was mainly caused either by disease or by poor husbandry. This distinction has not strictly been tracked down but a fairly good estimate was that 50% of the hide injuries were caused by the slaughterhouse.

Corresponding quality costs for pork were:

Slaughter injuries	£ 0.013/kg slaughter
PSE (frequency 12%)	£ 0.004/kg slaughter
Other injuries	£ 0.002/kg slaughter

Meat processing plant

In one meat processing plant data was collected continuously. At that meat processing plant quality costs were, in total, about £ 0.08/kg of manufactured product. In some cases quality costs have already (after 1 year) been reduced considerably.

For example, packages having vacuum leakage sorted out by the pricing department amounted to about 15 öre/kg (£ 0.013/kg) when quality cost analysis was initiated. After 12 weeks this cost had been reduced by 4 öre/kg (£ 0.0035/kg). This reduction doesn't seem too great, but in a year about SEK 160,000 (£ 14.235) had been saved.

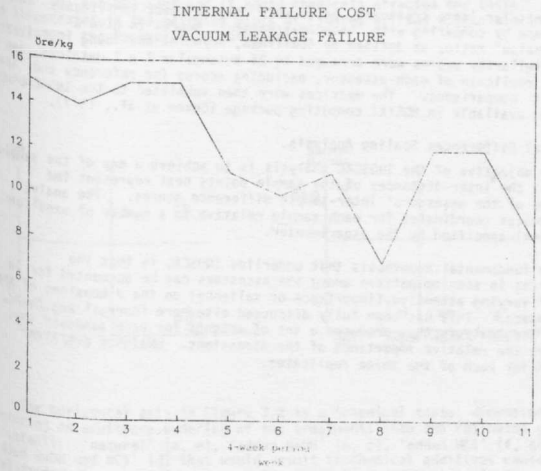

Figure 3. Vacuum leakage presented as öre/kg from one particular meat processing plant.

Conclusions

The results presented here are only the beginning of the process to find proper and acceptable systems of quality cost analysis in the Swedish meat industry. However these preliminary results show that quality cost analysis is a field well worth further development.

Our experience so far shows that the best way of reducing quality costs and improving quality is to use preventative measures. A good method is to report, explain and discuss quality costs at all levels within the company.

References

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