Fact sheet – Developing a predictive model to assist in the purchase and implementation of new processing technologies

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Introduction

There is a wide range of technologies, processes and practices already implemented in the red meat processing industry aimed at improving productivity and efficiency. Furthermore, new developments in this field are continually evolving.

AMPC recently identified the need for the development of a predictive model which incorporates key costs and benefits associated with technology investment to enable the red meat processing industry, at the plant level, to help improve decision making on future technology investments.

The key objectives of this project were to:

- document the range of technologies available to the red meat processing industry
- assess the costs and benefits associated with the implementation of each technology using industry data
- develop a cost benefit checklist for inclusion in developing the predictive model
- develop a predictive model through a series of inter-linked spreadsheets enabling calculations of net present value, internal rate of return and pay-back period.

Review of industry available technologies

A list of new processing technologies currently employed commercially, through facilitated adoption or being trialled in the red meat industry were reviewed, and costs and benefits were assessed.

Overall, 48% of the technologies examined related to innovations in slaughtering with 58% relating to sheep and lambs, 35% relating to cattle and the remaining 7% being applicable across all species. A further 41% of technologies were associated with innovations in boning of which half were associated with sheep and lambs and 41% with cattle.

The technologies for which investment costs were available reflect a total planned investment cost of approximately $45 million of which $30.28 million is directed towards technologies for sheep, lamb or goats, $12.87 million for cattle and $1.84 million for both.

Development of the predictive model

The predictive model developed through this project is based on the cost benefit outcomes associated with the review of lamb and beef boning technologies described on page 1. The key benefits observed from these technologies generally relate to:

- WH&S savings through reduction in laceration injuries, sprains and strains.
- reduced wastage, resulting in increased yield from cutting technologies.
- reduced bandsaw dust.
- reduced labour requirements.
- increased productivity as a result of more consistent throughput per shift.
- increased shelf-life and reduced levels of discounting.

Clearly, a predictive model, designed to assist a red meat processor in assessing the potential net returns from a technology to their own business operations, does not have the benefit of real data post-implementation. Accordingly, the model developed as part of this project is designed to enable the processor to assess the impact on their operations by allowing them to vary percentage changes in a number of operating parameters. The observed variations from the cost benefit analyses have been incorporated as the base case in the model.

Key variables in the model, which should be collected by the red meat processor in relation to existing operations, include:

- number of employees by category per shift and associated hourly wage rate, including on-costs.
- hours of operation per shift, number of shifts per day and number of operational days per annum.
- throughput per hour;
- costs associated with Workers Compensation insurance.
- estimates of yield losses through cutting inaccuracies or exceeding market specifications.
- estimates of value of wastage from bandsaw dust.
- revenue derived from the various primal cuts.
- level of discounting at the retail level.

The model then permits the individual plant to compare these with the base data derived from the existing cost benefit analyses to determine the possible impact on their operations. Alternatively, the model can be used to identify the level of savings required under each parameter to make purchase and installation a cost-effective solution for the plant.

Predictive model outputs and outcomes

The predictive model has been developed to assist businesses in making a decision on investing in new technologies. In particular, the model provide important information on net present value, internal rate of return and the payback period.

Net present value

The outputs from the predictive model assumes a 10 year life-span on technologies implemented. The net present value of the net cash flow is calculated using a real discount rate of 7%, in accordance with Federal Government guidelines. However, an alternate real discount rate of 10% has also been incorporated as an option, as this may be more appropriate in the commercial sector.

Payback period

The simple payback period output enables a business to determine how long it will take to recoup the capital investment outlay, based on estimated net benefits from the new technology. Clearly, the

shorter the timeframe, the more attractive the investment would be for a processing business.

The benefit cost ratio measures the stream of discounted benefits using real discount rates to provide businesses with an indication of the cost/benefit ratio associated with introducing the new technology.

Internal rate of return

The internal rate of return calculation enables the business to ascertain whether the project has a yield greater than its established minimal acceptable rate of return or cost of capital.

Benefits to industry

The outputs of this project will provide particular assistance to small to medium meat processing businesses in not only determining whether a certain technology generates an acceptable return on investment but also permits comparisons with alternative capital investment options.

Further information

For further information please contact AMPC on (02) 8908 5500 or email info@ampc.com.au.