final report

Project code: A.COP.0033
Prepared by: ProAND Associates Pty
Date submitted: August 2006

PUBLISHED BY
Meat & Livestock Australia
Limited Locked Bag 991
NORTH SYDNEY NSW 2059

Rendering cost model instruction manual

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

Contents

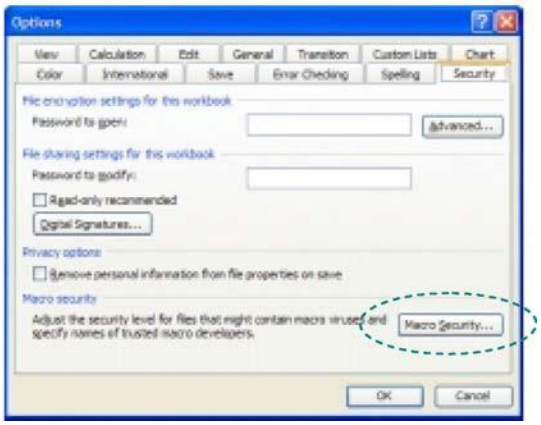
1 Rendering model

The rendering cost model is designed to allow the standardisation of rendering KPI's for the purpose of allowing rendering operations to identify performance over time and identify where actions may be taken to reduce costs and increase profitability.

Please note:- The screen pictures used in this user guide do not reflect the data of any rendering operation and will not give typical outputs when entered in the model.

2 Model operating parameters

- The model has been built on Microsoft Excel XP but will also run on Excel 2000, the model has not been tested on earlier versions of Excel and is very unlikely to run on Excel 95.



- The model makes extensive use of Excel Macro's and Visual Basic codes and routines. To allow the model to run correctly the security levels in Excel need to be set to the appropriate level.

  The Microsoft Excel setup of this can be found in the Excel menu under "Tools >, Options" with the "Security" tab selected. On this page there is a button titled "Macro Security" this needs to be selected to bring up the options for how macros are handled when opening Excel spreadsheets that run macros

The selection of 'Medium" will allow you to choose to run the macros in the model when opening the file.
"High" or "Very High" will open the model but will disable macros preventing almost all model functions and operations.

- Opening the model (after accepting the operation of the macros in the model) the user is presented with a single page. This shows the buttons for opening the data entry form (on the left side of the screen) as well as the benchmark outputs. (this is shown in figure 1 below)

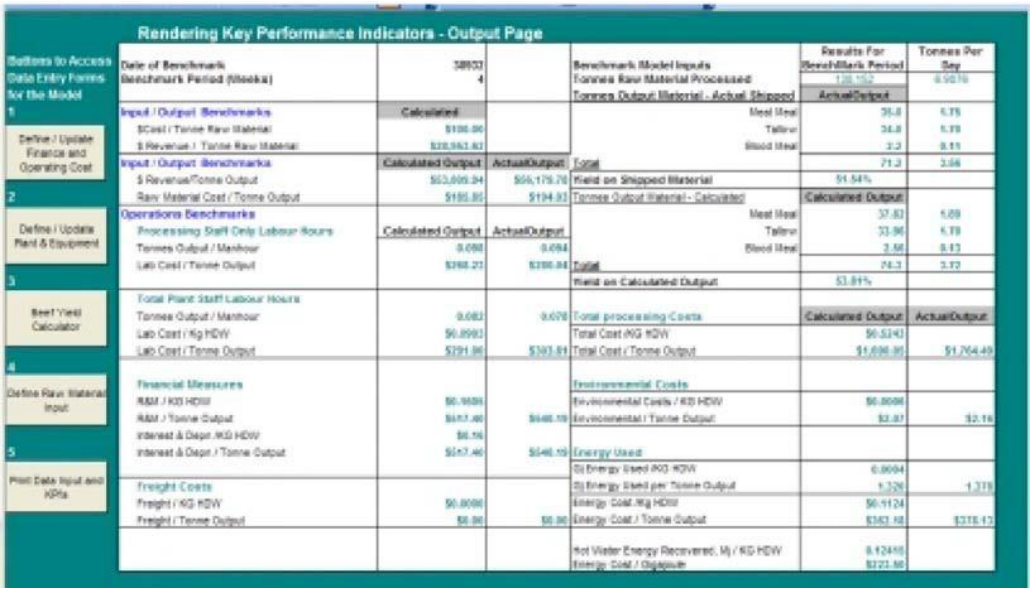
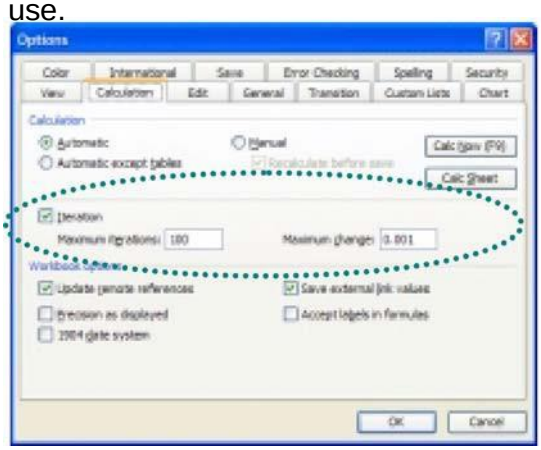


Figure 1 - Output page of the model showing KPI Results

- The model is basically broken down into three areas of input and calculation and each of these is associated with a number of pages on three entry forms.
    - Financial inputs
    - Plant set up arrangements
    - Raw material information

There is only one results page (figure 1 shown above), no other parts of the model need to be accessed for normal use.



- To reduce the amount of data entry required previously entered data (i.e. already in the model) is retrieved when a form is reopened, care needs to be taken to ensure that retrieved data is accurate as previously incorrect data (if entered) is also displayed and this will perpetuate errorE
- The calculation of blood meal output requires the use of a circular reference in the calculation (i.e. the output of the calculation is also an input for the equation). The default installation of Microsoft Excel is to highlight this (circular reference) as a potential error in the formula.

To overcome this Excel needs to have iterations turned on. This is achieved by going to the menu bar and selecting “Tools > Options” and selecting the “Calculation” Tab. Select the Checkbox for “Iterations” the standard setting of 100 / 0.001 iterations are ok for the model to function correctly.

- Throughout the model volumes of material are processed as Kilograms although for the purposes of results these are converted to Tonnes of material.

3 Structure of the model

The model has been designed with a view to the operations of different rendering plants and as such it has needed to reflect the different operators and the different types of plant and methods of recording activity.

While benchmarking comparisons are better made over longer time periods (preferably 12 months to iron out fluctiations in processing, seasonal factors, plant maintenance and breakdown etc) the model is designed to show results over a shorter time period. This is achieved by using two classes of data.

- Operational data such as abattoir kill, bought in raw material, products sold etc may be entered for any time period as long as the time period is defined on the data entry form and the data is all for the same period.
- Plant related data is entered on the basis of annual operations and include items such as interest and depreciation, staff costs, repairs and maintenance etc. These annual cost are then adjusted, in the model, to align with the time period defined for the operational data.

Data entered into the data entry forms is not written to the model until the “OK” or “Data Entry” buttons are clicked, however once this is done previously entered data will be overwritten. Each time a form is opened the last entered data (now in the model) is displayed on the forms.

In all cases clicking the “Cancel” button will close the form, this action will not enter data into the model.

Changes to the model data will only be permanently saved by using the conventional “File” “Save” buttons on the Excel toolbar(Results and discussion) - Section

4 Data entry

4.1 Financial and operating cost forms – 1

This form comprises five pages to define the costs and revenues of the business:

4.1.1 Raw material costs

"Raw Material" allows the user to define the costs of raw material entering the process plant in two ways:

- For a meat processor the model will calculate the raw material outcomes on the basis of user defined kill and yields. The model allows this raw material to be valued by the rendering plant as cost input.
- For a service renderer or a meat processing plant that processes outside material this may be valued at a different actual cost. The model allows for two pricing arrangements to be run independently.

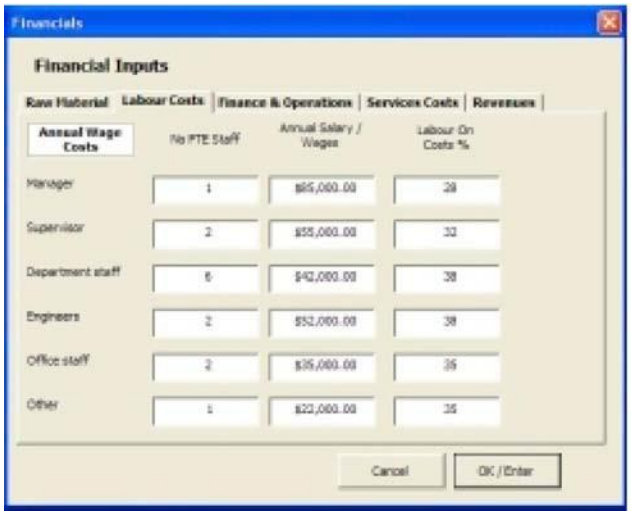
Clicking on the "Clear Data" will clear the form of any data in the textboxes, however the cost data will only be deleted from the model when the "OK/Enter Button" is clicked. Closing ("Cancel) and then reopening the form will reload the data from the model.

The "Enter Data" will enter the data into the model but leave the form open for

further use. Comment:

Some meat processing plants do not in the normal course of operations value raw material sent to rendering from killing and/or boning operations for a variety of reasons. In the operation of the model this will not significantly affect outcomes other than to distort input cost measures and the notional value of profit from the business unit. Other volume based measures
remain unaffected and provide adequate input measures of value and performance.

4.1.2 Plant labour cost

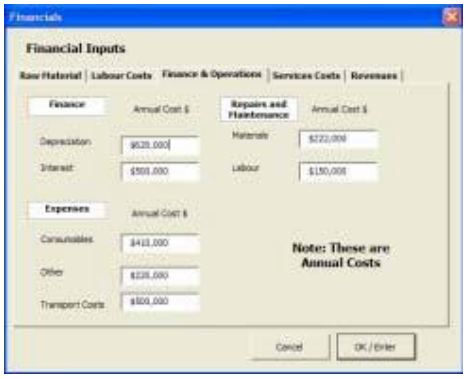


"Labour Costs"

The labour costs associated with rendering are input into the model on the basis of annual cost. The annual costs of each employee is noted as the salary/wage cost paid to the employee without labour employer on-costs such as superannuation and holiday pay etc. These on-costs incurred in the employment of staff are noted.

Finance and overhead costs

Input of the annual overhead costs or running the rendering operations are broken into three areas:



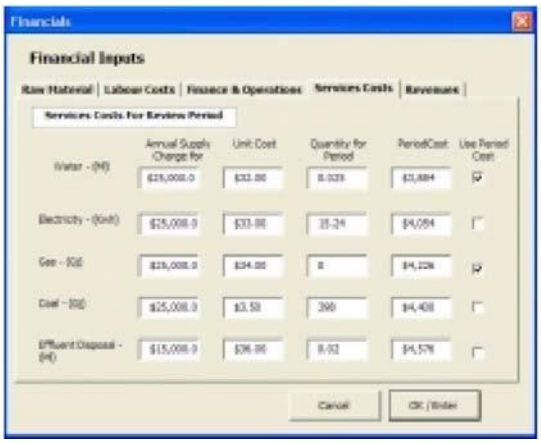
- Finance and Depreciation – This is split into the interest paid on the capital financing of the plant and the ongoing depreciation.

- Repairs and Maintenance – this is entered as materials and labour and is in some respects an arbitrary input in that depending on the operation of the plant this will have been separately recorded. In some instances however by the use of contractors etc R&M may only be recorded as a single line item.
  This may be entered into the model either by an arbitrary split or as a single item.

  Depending on the age of a plant the interest and depreciation or the repairs and maintenance may seem high however often these items tend to offset one another in that a new plant may have high interest and depreciation whereas
  an older plant that has little capital expense balances this with high maintenance costs.

- Other costs have been broken into Transport costs, consumables (bags, wrapping etc) and a remainder item in other

4.1.4 Service costs



- Services costs may be entered in two ways, depending on how data is collected from the plant, however, in each case the data needs to match the period of review.

- Information may be entered on the basis of the supply arrangement with the services supply company and the volume of units recorded as used.
  The Supply Charge is to be entered as an annual cost and this is then recalculated to match the Period of Review. The quantity used is to match the period of review and the model will use the information to calculate the total costs for the review period.
- The alternative is to enter the costs for the period as received by the company and ignore the unit supply arrangements. To use this enter the total cost for the period and select the “Use Period Cost” box. If the box is ticked the unit costs will not be used and there is no need to remove the data from the model.

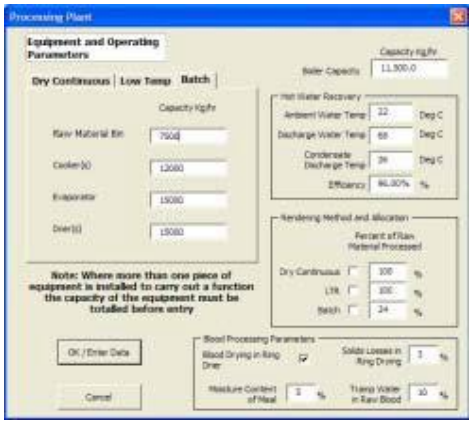
However if there is not a use for a line item (say nil coal use) then the data in the boxes must be cleared to prevent it being used in calculations.

4.1.5 Product revenues

These are entered for the period under review and therefore need to match the actual volumes shipped entered on the “Raw Material Input Forms”.

4.2 Plant and equipment forms - 2

4.2.1 Rendering method



The model is based on the use of up to three commonly used rendering systems and allows for one or all of the systems to be used. The model provides for the allocation on a percentage basis for raw material to be allocated to each of the systems. At least one rendering system must be selected for use for the model to accept the data on the form. If a rendering method is not selected then a warning dialogue box will appear on screen. Clicking on “OK” will close the box and return the user to the form to make a selection. None of the data on the form will have been entered in the model. If a checkbox is not selected then the process is not selected for inclusion in the models calculations and hence it is not necessary to remove the data from the form to prevent it from being used in the model.

4.2.2 Hot water recovery

The model calculates the energy saving where this is used in a meat processing plant on the basis of the parameters entered. The default in the model is for the saving to be calculated. If a hot water recovery system is not installed then the efficiency needs to be reduced to zero to negate any included savings.

4.2.3 Blood processing

The model provides for blood drying to be carried out either in a batch cooker or through a ring drier. The essential difference for the model is in accounting for solids losses in the ring drying operation. The moisture content of the finished meal and the amount of tramp water (plant added water) in the raw blood are also variables that are adjustable in the model

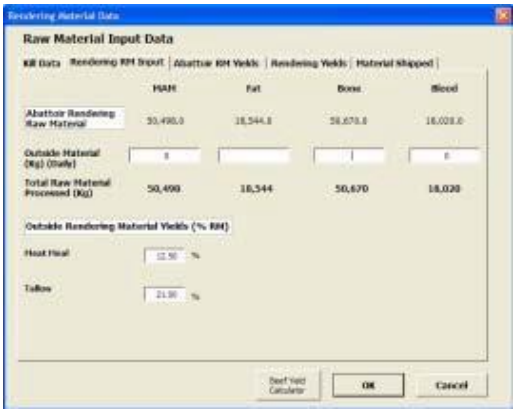
4.3 Raw material forms

The forms for entering data directly related to the processing of material are grouped on five pages of the form that is presented when the “Define Raw Material Input” is selected.

4.3.1 Kill data

The “Kill Data” page of the form provides for the input of data relating to the kill of the meat processor for the review period. The period of the review of costs is also defined on this page and can be entered in either days or weeks. The model must know which time frame it is dealing with which is activated by selecting one of the buttons on the form. Selecting the “Enter Kill Data” will enter the kill data on the form into the model and provide the output on the “Rendering RM Input” page. This will not close the form, however it should be noted that when the data is entered it will overwrite data previously entered in the model. Beef kill data only may also be entered by the use of the sub form “Beef Yield Calculator” described in section 4.4.

4.3.2 Rendering RM input



This page allows for the entry of raw material volumes that are not the result of the regular kill at the meat plant, i.e. outside raw material. The amount of raw material needs to be entered in Kilograms. The information on the total raw material processed line will not be updated until the “OK” button has been selected.
The model recognises the possibility of different yields for meat and tallow for outside materials and allows for these yields to be entered on this form.

4.3.3 Abattoir RM yields

The “Abattoir RM Yields” form allows for user input to determine the amounts of raw material going to rendering on the basis of the kill level input on the “Abattoir Kill Data” page.
Using the “Clear All Data” button will clear existing yield information from the form. The information is not removed from the model until the “OK” button is selected. If the data is deleted by mistake select “Cancel” to close the form and then reopen the form. This will reload the data from the model.

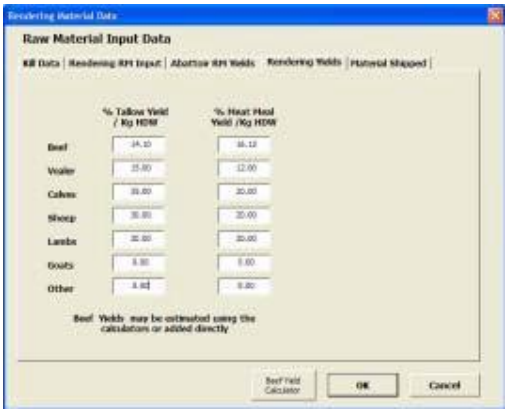
without any detrimental effect on the model. The data from the “Beef Yield Calculator” will input data into this form and can provide a guide for raw material yields however, it is the information from this form that when combined with the “Kill Data” calculates the amount of raw material that is rendered in the model.

The “Fat” and “Bone” references on the form relate to boning room fat and bone and therefore normally the addition of these two numbers should relate the boning room yield, ie if the boning room averages a yield of 70% yield then these two yields combined should equal 30%.

4.3.4 Rendering yields

The data on this page enables the calculation of yield from each species from the “Kill Data” page.

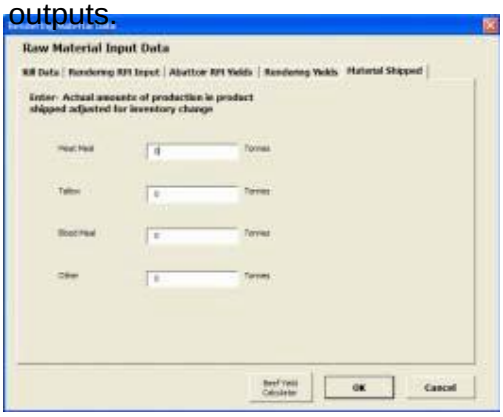
The yield for the beef kill may also be derived using the “Beef Yield Calculator”



4.3.5 Material shipped

This page allows for the actual amounts of product processed for the period under review to be entered. This allows the model to determine performance indicators to be determined for calculated outputs as well as actual outputs.

This provides a reference point to assess the accuracy of the yield data in the model and for it to be adjust as necessary to improve the accuracy of the model calculations.



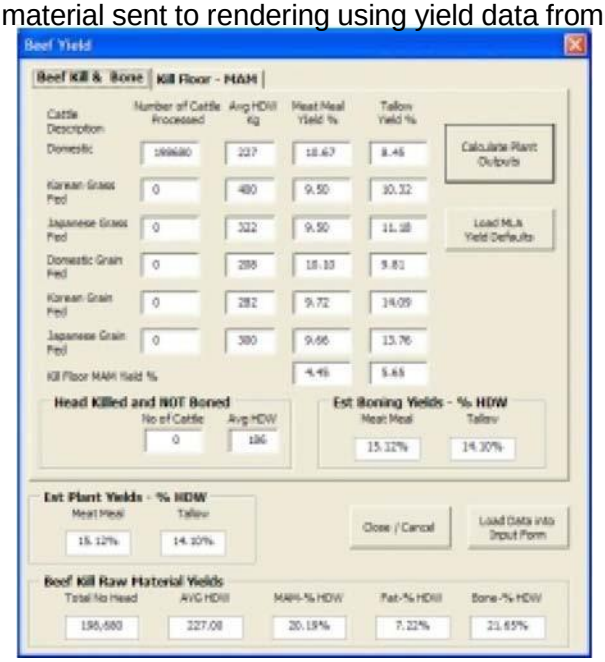
4.4 Beef yield calculator – 3

The “Beef Yield Calculator” forms may be accessed either directly from the front page of the model or from the “Define Raw Material Form”.

The calculator consists of two pages to allow the calculation of material sent from the kill floor and the boning room of the meat processing plant.

4.4.1 Beef kill and bone

The boning room page allows the input of boning numbers for six classes of cattle and is used to determine the likely yield of meat meal and tallow from the rendering operation. The default output of the model is based on data determined by CSIRO and published by MRC in 1992 (By- Products from Sheep And Cattle, W F Spooncer, Meat Research Report 2/92). The kill numbers and HDW data entered as boning data is also used by the model to determine the kill floor material sent to rendering using yield data from the same MRC report.



It is also an option on this page to enter a kill for animals that are not processed through the boning room. Data from this entry is not included in the calculation for the fat and bone going to rendering but is included in calculating the kill floor raw material.

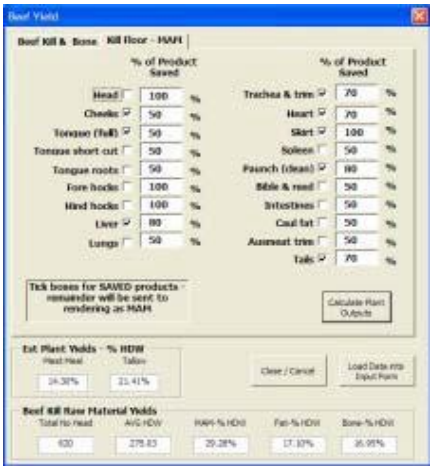
Selecting the “Calculate Plant Output” button will use the entered data to provide the output of tallow and meat meal from the entered data. The model uses both the boning room and kill floor data on the forms when calculating the output prediction.

It should be noted that this operation will overwrite previously entered data in the model.

After calculation the form will stay open for other operations. If it is considered that the output from the data does not represent the output of the plant, based on operating experience, then different yields may be entered and to achieve the desired result.

The MRC data is stored in the model and may be re-entered at any time by using the “Load MLA Defaults” button.

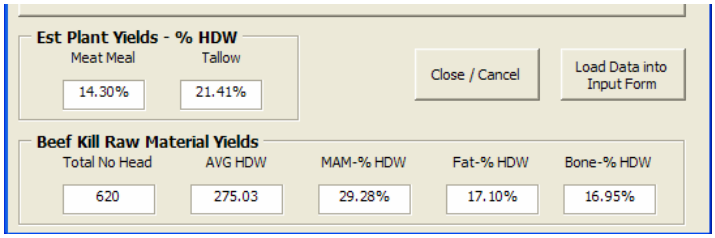
4.4.2 Kill floor raw material



This page allows the amount of products saved from the kill floor operations to be entered. The model works on the premise that any material not saved will be sent to rendering.

The material is calculated on the basis of the classes of cattle entered on the boning page and the hot dressed weight of those cattle. The raw material is calculated on the basis of cattle weight however it is not possible to save different offal products from different classes of cattle. For example, the input to the model will not allow tripe to be collected from domestic cattle and not Japanese Ox. Using the "Calculate Plant Output" button will calculate the plant outputs (including the boning room output) and display it on the page for reference.

4.4.3 Main form



The percentage yields and outputs shown on the bottom of the page are the calculated outputs that will be entered that will be entered into the model when the "Load Data into Input Form" is selected. This data is updated each time a "Calculate Plant Outputs" button is selected. (Kill floor or boning room data).

If this button is not selected the output data will not be entered into the model.

The form will only close when the "Close/Cancel" button is selected. This will close the form – it will not enter data into the model.