

Figure 11: Notes to Economic Analysis

These notes correspond to the respective tabs and sections within each tab on the illustrative spreadsheet provided for estimating project revenues and expenses.

❖ General comments

➤ To use this analysis tool:

- Start with 'economics1' tab, go to the Key Inputs & Outputs page, and go to the enterprise configuration section (see below for additional instructions).
- The user can modify all assumptions/hard-entered numbers as desired.

➤ Formatting conventions used:

- All assumptions/hard-entered figures are in blue font.
- Key assumptions are in yellow-highlighted cells.
- Figures referencing key assumptions elsewhere in the model are shown in "plum" font color.
- Key results are in blue-highlighted cells.

❖ 'Economics1' tab

➤ Key Inputs & Outputs

▪ Enterprise configuration

- This spreadsheet has been designed to have up to six different scenarios defined (each scenario can be defined by the user), and to be able to quickly jump to a scenario by simply selecting that scenario's number.
- Define up to six scenarios...each scenario is a combinations of target slaughter rates (head/day) by animal type.
- Select the scenario you want to evaluate by inserting the scenario # in cell P11.

▪ Operations

- The target slaughtering rate is derived from the Enterprise configuration.
- The average live weights are lower than those typically found on the mainland, and are based on preliminary information obtained from producers in the islands.
- Carcass yield for beef is estimated for grass-fed; yields for pigs and goats/sheep are estimates that need to be verified for each operation.
- Live weight costs are simply rough estimates for a hypothetical commercial operation and do not necessarily reflect current prices for personal consumption in the Marianas. Since, as of Q1 2011, there are no formal animal markets in the Marianas (i.e., no auction barns and no commercial

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slaughterhouses with animal production contracts), no data exists on which to base estimates, so a commercial operation may reflect significant variance from these initial projections.

- **Meat products**
 - In this section, the types of products are identified (the model can accommodate up to 5 products). Identify (or modify) the product name by overwriting the text in cells C15, C20, C25, C30, and/or C35.
 - For each product, the amount of product is determined by weight (as a percent of the carcass), the retail price is estimated, and the whole/sale retail price ratio is estimated. It is assumed that the meat business will sell its products into wholesale markets. Each of these assumptions must be adjusted for local conditions.
 - The figures in “pink” font color are weighted averages, based on total carcass weights per year per animal type.
- **Key (variable) operating expenses**
 - The cost of wrapping and packaging the meat products is estimated; the initial assumed value in the model is considered a very rough estimate; the figure used must be adjusted for local conditions, e.g., it must reflect the type and extent of packaging to be used by the facility on average for the target products.
 - The local markets fraction of products sales is the targeted portion to be sold on-island. The off-island fraction is simply the remaining fraction of sales.
 - The transport costs are preliminary estimates of total costs of transporting the products to for local and off-island markets.
- **Financial**
 - An optional grant amount can be included, if considered available.
 - The equity fraction reflects the portion of the capital cost that must be provided as equity.
 - The debt term and interest rate are self-explanatory.
 - IRR refers to [Internal Rate of Return](#), and is calculated on the full range of cash flows, including the initial investment period.
 - NPV refers to [Net Present Value](#), and is calculated on cash flow.

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➤ Proforma

- The proforma model is set up to evaluate costs up to a 15-year operating life. However, with adequate maintenance the useful (service) life of a facility should be longer.
- All dollar figures in the proforma are in thousands.
- Year 0 represents the investment and construction period, which is assumed to occur in the year prior to operating year 1.
- Revenues are derived from 'economics2'.
- Cost of goods sold includes both cost of live animals and variable operating expenses.
- Operating expenses include estimated fixed expenses, debt interest payments, and depreciation.
- The forecasted income statement does not consider taxes or accelerated depreciation options.
- The last line of the cash flow section reflects cumulative cash flow over the project life.
- **Important note:** This proforma model assumes full production of meat products beginning in year 1; in reality, the enterprise will likely ramp up production over time, and the model should be revised to reflect such ramp-up.
 - And the IRR and NPV will likely be lower for such a ramp-up scenario.

➤ Graphs

- Graph #1 shows the estimated wholesale prices of the various meat products by meat type.
- Graph #2 shows the total estimated live weight to be slaughtered (pounds/year) by animal type (refer to the scenario selected in P11).
- Graph #3 shows the total enterprise expenses in \$ per pound of carcass weight.
- Graph #4 shows the total estimated revenues by product (combined for all selected animal types).

❖ 'Econ2' tab

➤ Product pricing & sales revenues

- These calculations are based on the various assumptions set forth in 'economics1'.

➤ Capital costs ("capex")

- Illustrative estimates are provided for site, slaughterhouse, and processing facility; more refined cost data should be obtained for a specific project site. Use this tool and these figures merely as a guide, and insert project-specific figures where appropriate.

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- Separate capex estimates can be included for liquid vs. solid waste management systems.
 - Additional capital costs (“capex”) may be required for a specific project.
 - A line item for contingencies is included and can be adjusted as desired.
 - **Operating Expenses**
 - The costs of animals are based on the various assumptions set forth in ‘economics1’. These are included as “Cost of Goods Sold” in the proforma.
 - Fixed operating expenses include labor, USDA inspection costs (if any), utilities, and other.
 - Variable operating expenses include wrapping/packaging and product transport costs, are included within “Cost of Goods Sold” in the proforma.
 - **Other Economic & Financial Assumptions**
 - Annual inflation factors are incorporated in the proforma.
 - Project financing
 - Total capital includes estimated costs plus working capital. The default assumption for working capital is based on a duration of 3 months, but can be changed as desired for a specific situation.
 - Equity and debt calculations are straight forward, and are picked up by the proforma.
 - Depreciation is considered straight line; the duration is an assumed variable. A more detailed project-specific analysis might include accelerated depreciation options.
- ❖ **Operations tab**
- **Slaughtering Operations**
 - Facility operating time:
 - it is assumed that the slaughterhouse and processing facilities are integral and utilize the same labor force.
 - It is further assumed that the slaughterhouse will operate 3 days/week and the processing facility will operate the balance of 2 days per week.
 - Different assumptions for local conditions should be used as appropriate.
 - Target slaughter rates: net design slaughtering rates assumptions are in the **economics1: Key Inputs & Outputs section**; refer to the “Pen Design” for cull rates and total required average receiving rates (animals per day).
 - Average live weight: assumptions are in **economics1**.
 - Average carcass yield: assumptions are in **economics1**.

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- **Processing / Meat Products**
 - This section evaluates the production of each product (by meat type, based on the scenario selected in [economics1](#)).
- **Cold Storage Design**
 - This section is intended to provide a sense of scale regarding the sizing of the cold storage unit.
 - A more detailed design will be required for specific design purposes, based on the aging/storage requirements, method of materials handling into and out of the cold storage units (which equates to efficiency of space utilization), and other factors.
 - If product freezing will be included in the overall enterprise design, then a suitable freezer unit(s) must be added to the design and cost estimates.
- **Pen Design**
 - This section is intended to provide a sense of scale regarding the sizing of the receiving and holding pens required for live animals.
 - Estimates of manure production are provided to enable planning for management of manure generated in the pens.
 - Manure production rates were obtained from the *USDA NRCS Agricultural Waste Management Field Handbook, Chapter 4 - Agricultural Waste Characteristics*:
<http://policy.nrcs.usda.gov/OpenNonWebContent.aspx?content=17768.wba>
 - ◆ For beef: table 4-8(d);
 - ◆ For pigs: table 4-10(d);
 - ◆ For goats/sheep: table 4-13.
- **Slaughterhouse byproducts/waste production**
 - This section is intended to provide a sense of scale regarding the amount of liquid and solid byproducts and/or waste that would be generated from slaughtering activities (to enable waste management planning).
 - The estimated percentages (by weight) for the various waste components should be modified as appropriate based on the extent to which some of the material is further segmented into waste vs. marketable products.