# The Feasibility of Constructing and Operating a Cull Cow Slaughter Facility in Utah 

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# THE FEASIBILITY OF CONSTRUCTING AND OPERATING A CULL COW SLAUGHTER FACILITY IN UTAH 

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# THE FEASIBILITY OF CONSTRUCTING AND OPERATING 

## A CULL COW SLAUGHTER FACILITY IN UTAH

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# THE FEASIBILITY OF CONSTRUCTING AND OPERATING 

## A CULL COW SLAUGHTER FACILITY IN UTAH

Donald L. Snyder and Van Johnson


#### Abstract

Potential animal numbers range from nearly 170,000 head to almost 370,000 head. The construction costs for a 400-head per day slaughter plant would be nearly \$10,000,000 in 1995 dollars. The largest two cost items are the building (and associated mechanical facilities) and equipment. Assuming one shift per day operating at $90 \%$ capacity, the total (fixed and variable) cost per pound of meat processed would be approximately $\$ 1.32$ per pound. The revenue associated with such a plant is estimated to be $\$ 1.35$ per pound, leaving a net return of $\$ 0.03$ per pound of processed meat, which would return approximately $\$ 1,000,000$ per year at this operating capacity. Profitability is sensitive to the cost of the animals live, the ability to keep the plant operating at $90 \%$ capacity or better, and the price of processed meat.


# THE FEASIBILITY OF CONSTRUCTING AND OPERATING 

## A CULL COW SLAUGHTER FACILITY IN UTAH

(Dale T. Smith \& Sons Plant)

## Introduction

Utah has had a long history of cattle production, primarily cow-calf production due to the state's natural resource base. In addition to the cow-calf operations, some cattle feeding exists, as does cattle slaughter. The fattening activity is dispersed throughout the state, though it mostly occurs in areas of excess feedstuff production. Cattle slaughter facilities are also scattered throughout the state, though larger commercial facilities are limited. The largest plant is located in northern Utah and the second largest plant is located near Salt Lake City, Utah.

The northern plant has gradually increased its slaughter capacity to the point that it can slaughter up to 2,000 head per day. The Dale T. Smith and Sons plant can slaughter approximately 120 head per day. (Most other slaughter facilities are limited to no more than 24 head per day.) There has been some concern regarding the location of the Smith operation as urban pressures increase and land near the plant becomes more valuable. Due to this increasing urban pressure, plus a desire to become more efficient in terms of size, this study was undertaken to examine the possibility of moving and expanding operation to provide more added value to Utah's cattle industry.

Given the labor and tax benefits that could occur in many rural communities, there are a number of locations which would find a plant siting beneficial. Several specific sites were included in the analysis including (a) Delta in Millard County, (b) Brigham City, Box Elder County, and (c) the Uintah Basin.

In the analysis which follows, several specific topics are covered. First, marketing zones are defined from which the available supply and demand of cull cattle are discussed. Second, estimates of supply are made. In an analysis of "processing" or "market" feasibility, supply and demand considerations become paramount in determining whether a firm can acquire a profit in the long run. Third, fixed costs are considered, followed by operating costs. Fourth, meat and by-product revenues are estimated. Finally, conclusions are drawn with respect to the proposed plant siting.

## Study Zones

In an attempt to identify the possible supply of cull cows, potential supply zones were identified. Typically, cattle moved to a slaughter operation are drawn from within a 300-500 mile radius surrounding the plant. It was assumed that such a radius would be consistent for the type of operation considered in this study as well.

Potential supply zones were identified that correspond to areas within each of the counties identified above. The potential market area for each site was determined by "drawing" a 300 and 500 mile boundary around each site. Obviously, the boundaries overlapped other sites given the location of each site.

Each zone included counties from within Utah, as well as counties from states surrounding Utah.

## Potential Supply

There is a generally shared view in the livestock industry that packers should located where the livestock are available. Having cattle close to the plant is important to keep down transportation and other costs. Some packers have resorted to a feed yard situation to make assurances that the cattle numbers are sufficient to meet plant demands.

As noted above, the number of cull cows must be estimated since separate records are not kept on cull cow slaughter either on a county- or state-wide basis. In order to obtain a range on the available supply, four scenarios were examined. Each scenario is explained below.

A plant capable of processing 400 head per day (or shift) was modeled. Assuming that such a plant operates at $90 \%$ of capacity. If only one shift is operated and 260 operating days per year is assumed, this would imply a needed supply of over 93,000 head of cull cattle. (If two shifts were operated per day and achieved $85 \%$ capacity operation, 176,800 head would be required.) Hence, available supply should be at least 93,600 head up to 176,800 head.

## Scenario I

The National Livestock Slaughter Summary has the cattle slaughter broken down by category (steers, heifers, mature cows, bulls, stags, etc.) over 10 regions. Regions six, eight, nine, and ten contained states deemed to be of interest to the present study. Total cattle inventory numbers for Utah and surrounding states are shown in Table 1. In order to determine the number of cull cows available within these areas, the regional slaughter numbers were allocated according to each state's (and county's) cow inventory numbers. For example, since Utah's share of the total regional cattle inventory was $11.8 \%$ and the total number of cull cows (plus stags and bulls) slaughtered were 434,149 animals, Utah's available supply of slaughter cull cows was determined by taking that $11.8 \%$ times the total 434,149 animals slaughtered.

## Scenario II

This scenario is based on an estimate of cow replacement rates as published in the various state agricultural statistics publications. For instance, the Utah Agricultural Statistics separates replacement heifers over 500 pounds into beef cows and milk cows. Beef cow replacements for 1994 were projected to be 69,000 head. Milk or dairy cow replacements were projected to be 45,000 head. See Table 2 for totals of cull cows for Utah and surrounding states.

Table 1. Estimated Cull Cow Slaughter Based on National Livestock Slaughter Summary data

| STATE | INVENTORY | SHARE | SLAUGHTERED COWS |
| :---: | :---: | :---: | :---: |
| UTAH | 850,000 | $11.8 \%$ | 51,230 |
| NEVADA | 480,000 | $6.7 \%$ | 29,088 |
| IDAHO | $1,680,000$ | $23.3 \%$ | 101,157 |
| WYOMING | $1,350,000$ | $18.7 \%$ | 81,186 |
| COLORADO | $2,850,000$ | $39.5 \%$ | 171,488 |
| TOTAL | $7,210,000$ | $100 \%$ | 434,149 |

Table 2. Estimated Cull Cow Slaughter Based on Stated Cow Replacement Rates

| STATE | CULL COWS |  |  |
| :--- | :---: | :---: | :---: |
|  | BEEF | DAIRY | TOTAL |
| UTAH | 69,000 | 45,000 | 114,000 |
| NEVADA | 41,000 | 6,000 | 47,000 |
| IDAHO | 100,000 | 95,000 | 195,000 |
| WYOMING | 175,000 | 1,000 | 176,000 |
| COLORADO | 150,000 | 40,000 | 190,000 |
| TOTAL | 535,000 | 187,000 | 722,000 |

## Scenario III

Scenario III was based on the estimated regional slaughter mix. The results reflect a slaughter mix of $21.4 \%$ for cull cows and $78.6 \%$ for steer, heifer, and bulls combined. Table 3 summarizes the estimated regional cull cow mix using this approach.

## Scenario IV

Scenario IV was based on actual cull rates as given by producers in the three study counties.
Two dairies and one beef operation were contacted in Box Elder County. The first dairy planned an average three year life span for his cows. He worked on a 30 to $33 \%$ replacement rate. The second dairyman worked on a $20 \%$ cull rate, primarily because he was expanding his herd size. The beef rancher culled an average between 10 to $15 \%$.

Table 3. Estimated Cull Cow Numbers by Regional Slaughter Mix

| STATE | \% OF STATE SLAUGHTER MIX | CULL COWS |
| :--- | :---: | :---: |
| UTAH | 21.4 | 46,651 |
| NEVADA | 21.4 | 26,488 |
| IDAHO | 21.4 | 92,115 |
| WYOMING | 21.4 | 73,929 |
| COLORADO | 21.4 | 156,161 |
| TOTAL | 21.4 | 395,344 |

Two beef producers from Millard County were contacted. Once again, one was in an expansion phase and he had only culled 10 cows from a 160 cow herd, resulting in a cull rate of $6.25 \%$. The second producer culled 14 head from a 135 cow herd for a $10 \%$ cull rate.

Three beef and one dairy operators were contacted from Uintah County. The first beef operator culled 60 to 70 head from his 300 cow herd, resulting in a cull rate of between 20 and $23 \%$. The next producer contacted ran both dairy and beef cattle. His 302 head dairy herd operated on a $22 \%$ cull rate, and his beef operation was based on a cull rate of 10 to $12 \%$. The last producer contacted culled his herd at between a $8.5 \%$ and $10.6 \%$ rate.

These percentages were used in determining an average cull rate for the two major cull cow groups, i.e., beef cows and dairy cows. The average used for beef cow herds was $15 \%$, whereas the average used for dairy herds was $35 \%$. Table 4 represents estimated cull cow replacements from an assortment of Utah cattle herds.

Table 4. Estimated Cull Cows Numbers Based on Producer Cull Rates

| STATE | CULL COWS |  |  |
| :--- | :---: | :---: | :---: |
|  | BEEF | DAIRY | TOTAL |
| UTAH | 51,000 | 28,000 | 79,000 |
| NEVADA | 34,500 | 7,000 | 41,500 |
| IDAHO | 75,300 | 67,550 | 142,850 |
| WYOMING | 112,950 | 2,450 | 115,400 |
| COLORADO | 123,000 | 28,000 | 151,000 |
| TOTAL | 396,750 | 133,000 | 529,750 |

## Summary

Tables 5 through 9 summarize the results for the four scenarios examined as part of this study for Utah and each of the surrounding states. It can been seen that regardless of which method is used to estimate the number of cull cows available for slaughter, there would be sufficient numbers of animals for the expanded output of the proposed plant.

It is clear that there are sufficient cull livestock to supply the needs of either a 400 head per day plant or a 800 head per day plant.

## Economic Feasibility

Data related to project costs and revenues are presented in this section. Cost considerations include fixed costs and variable costs. Revenue considerations include meat, plus all other revenues associated with the by-products of slaughtered animals.

## Fixed Costs

Fixed costs include plant equipment, waste disposal system, property taxes, insurance, and management costs.

The equipment list and schematic for the kill floor was provided by KOCH enterprises, a leading producer of meat slaughter and handling equipment. The general equipment list contains articles in the kill floor only. Table 10 contains the listing of equipment for the kill floor and the price associated with each item.

Table 5. Summary Comparison of Alternative Scenarios-Utah

| State/County | I | II | III | IV |
| :---: | :---: | :---: | :---: | :---: |
| UTAH |  |  |  |  |
| BOX ELDER | 4,559 | 10,146 | 4,152 | 7,025 |
| CACHE | 5,789 | 12,882 | 5,272 | 8,900 |
| DUCHESNE | 3,740 | 8,322 | 3,406 | 5,745 |
| MILLARD | 2,562 | 5,700 | 2,333 | 3,900 |
| UTAH | 3,637 | 8,094 | 3,312 | 5,565 |
| SEVIER | 2,305 | 4,674 | 1,913 | 3,490 |
| UINTAH | 2,613 | 5,814 | 2,379 | 3,925 |
| RICH | 2,869 | 6,384 | 2,612 | 4,395 |
| SANPETE | 2,766 | 6,156 | 2,519 | 4,270 |
| BEAVER | 1,948 | 4,332 | 1,773 | 3,000 |
| WEBER | 2,254 | 5,016 | 2,053 | 3,500 |
| SAN JUAN | 1,486 | 3,306 | 1,353 | 2,280 |
| EMERY | 1,332 | 2,964 | 1,213 | 2,070 |
| IRON | 1,230 | 2,736 | 1,120 | 1,885 |
| WASHINGTON | 973 | 2,166 | 886 | 1,470 |
| SUMMIT | 1,281 | 2,850 | 1,166 | 2,010 |
| WAYNE | 1,127 | 2,508 | 1,026 | 1,680 |
| GARFIELD | 973 | 2,166 | 886 | 1,500 |
| DAVIS | 871 | 1,938 | 793 | 1,365 |
| TOOELE | 973 | 2,166 | 886 | 1,515 |
| SALT LAKE | 1,178 | 2,622 | 1,073 | 1,795 |
| JUAB | 717 | 1,596 | 653 | 1,075 |
| KANE | 512 | 1,140 | 467 | 825 |
| PIUTE | 820 | 1,824 | 746 | 1,270 |
| CARBON | 717 | 1,596 | 653 | 1,140 |
| WASATCH | 820 | 1,824 | 746 | 1,285 |
| MORGAN | 717 | 1,596 | 653 | 1,025 |
| GRAND | 205 | 456 | 187 | 300 |
| DAGGETT | 256 | 570 | 233 | 375 |
| TOTALS | 51,230 | 113,544 | 46,464 | 78,580 |

Table 6. Summary Comparison of Alternative Scenarios—Nevada Adjacent Counties

| State/County | I | II | III | IV |
| :--- | :---: | :---: | :---: | :---: |
| NEVADA |  |  |  |  |
| Elko | 8930 | 14429 | 8132 | 12723 |
| White Pine | 1280 | 2068 | 1165 | 1824 |
| Lincoln | 785 | 1269 | 715 | 1125 |
| Totals | $\mathbf{1 0 9 9 5}$ | $\mathbf{1 7 7 6 6}$ | $\mathbf{1 0 0 1 2}$ | $\mathbf{1 5 6 7 2}$ |

Table 7. Summary Comparison of Alternative Scenarios—Idaho Counties

| State/County | I | II | III | IV |
| :---: | :---: | :---: | :---: | :---: |
| IDAHO |  |  |  |  |
| CASSIA | 5665 | 10920 | 5158 | 7975 |
| GOODING | 11026 | 21255 | 10041 | 15575 |
| TWIN FALLS | 8295 | 15990 | 7553 | 11700 |
| JEROME | 9003 | 17355 | 8198 | 12750 |
| BINGHAM | 4856 | 9360 | 4422 | 6990 |
| JEFFERSON | 2630 | 5070 | 2395 | 3660 |
| BONNEVILLE | 1922 | 3705 | 1750 | 2695 |
| FRANKLIN | 4046 | 7800 | 3685 | 5700 |
| MINIDOKA | 1821 | 3510 | 1658 | 2575 |
| BEAR LAKE | 2124 | 4095 | 1934 | 3020 |
| LINCOLN | 2327 | 4485 | 2119 | 3275 |
| PQWER | 1012 | 1950 | 921 | 1370 |
| BLAINE | 1214 | 2340 | 1105 | 1675 |
| ONEIDA | 1416 | 2730 | 1290 | 2040 |
| MADISON | 1214 | 2340 | 1105 | 1680 |
| CARIBOU | 1416 | 2730 | 1290 | 2025 |
| BUTTE | 1113 | 2145 | 1013 | 1590 |
| BANNOCK | 1214 | 2340 | 1105 | 1725 |
| FREMONT | 1012 | 1950 | 921 | 1430 |
| CLARK | 607 | 1170 | 553 | 900 |
| TETON | 1012 | 1950 | 921 | 1420 |
| TOTALS | 64945 | 125190 | 59137 | 91770 |

Table 8. Summary Comparison of Alternative Scenarios-Wyoming Counties

| State/County | I | II | III | IV |
| ---: | :---: | :---: | :---: | :---: |
| WYOMING |  |  |  |  |
| CARBON | 7307 | 15840 | 6654 | 10350 |
| FREMONT | 5358 | 11616 | 4879 | 7560 |
| SUBLETTE | 3897 | 8448 | 3549 | 5550 |
| LINCOLN | 4140 | 8976 | 2809 | 5840 |
| UINTA | 3085 | 6688 | 1035 | 4403 |
| SWEETWATER | 1137 | 2464 | $\mathbf{3}$ |  |
| TETON | 731 | $\mathbf{5 5 6 1 6}$ | 665 | 1650 |
| TOTALS | $\mathbf{2 5 6 5 5}$ |  | $\mathbf{2 3 3 6 1}$ | 1085 |

Table 9. Summary Comparison of Alternative Scenarios—Colorado Counties

| State/County | I | II | III | IV |
| :---: | :---: | :---: | :---: | :---: |
| COLORADO |  |  |  |  |
| MOFFAT | 2744 | 3040 | 2499 | 2446 |
| ROUTT | 2572 | 2850 | 2342 | 2335 |
| RIO BLANCO | 8574 | 9500 | 7808 | 7515 |
| GARFIELD | 3258 | 3610 | 2967 | 2862 |
| MESA | 5316 | 5890 | 4841 | 4678 |
| DELTA | 4973 | 5510 | 4529 | 4367 |
| MONTROSE | 4802 | 5320 | 4373 | 4303 |
| TOTALS | 32239 | 35720 | 29359 | 28506 |

Table 10. Kill Floor Equipment Listing

| ITEM | PRICE | ITEM | PRICE |
| :---: | :---: | :---: | :---: |
| Knocking Door | \$4300.00 | Saw Sterilizer | \$120.00 |
| Stunner | \$5900.00 | Head Flush Cabinet | \$1200.00 |
| Automatic Lander | \$2900.00 | Head Inspection Truck | \$1100.00 |
| Drum Hoist | \$6250.00 | Head Work Table | \$1200.00 |
| Shackel Lowerator | \$2400.00 | Evisceratind Dropper Spreader | \$5400.00 |
| Shackel 150 @ 10 | \$1500.00 | Pauch Truck | \$1100.00 |
| Lavortory | \$417.00 | Carcass Spreader | \$1950.00 |
| Blood \& Water Drain | \$200.00 | Splitting Shield | \$1000.00. |
| Air Leg Cut-Off \& Dehorning Saw | \$3618.00 | Splitting Saw W/Balancer | \$11112.00 |
| Bleeding Rail | \$1200.00 | Elevating Splitting Platform | \$3450.00 |
| First Leg Transfer | \$5400.00 | Saw Sterilizer | \$120.00 |
| 2nd Leg Transfer | \$4200.00 | Trim Platform | \$3450.00 |
| High Platform For Transfer | \$1800.00 | Inspection Platform | \$3450.00 |
| Siding Platform | \$3450.00 | Rail $2.59 / \mathrm{ft}$. |  |
| Air Dehider | \$1200.00 | Hangers 6.50 ft . |  |
| Leg \& Rumper | \$3400.00 | Trolley Stop .95 each @ 6 | \$570.00 |
| Hide Puller | \$24950.00 | Track Scale | \$4400.00 |
| Platform | \$6800.00 | Wash Platform | \$3450.00 |
| Brisket Saw W/Balancer | \$3950.00 | Beef Wash Pump | \$1200.00 |
| Pan Truck 4 @ \$750.00 | \$3000.00 | Pluck Wash \& Trim Table | \$1200.00 |
| Trolley Dolly 8 @ \$575.00 | \$4600.00 | Sterilizer | \$120.00 |
| Trolley 800 @ \$795.00 | \$6360.00 | Drums 200 @ 30.00 | \$6000.00 |
| Platform | \$3450.00 | Total | \$169,051.00 |

However, the cost estimate for the boning/fabrication floor is based on the cost associated with a typical fabrication floor since it was not possible to identify the specific layout. The cost of the equipment for the fabrication floor depends on a number of different factors, including the exact type of fabrication the plant will be involved with. The largest equipment expense is the deboning conveyors, but the setup basically has two options: (1) an eleven by fifty foot table or (2) two eleven by twenty-five foot tables. Both setups have the same characteristics and are typically costed on a per foot basis. Each table layout is based on a $\$ 2,500$ per foot charge. It also assumed that each person can break down $1 / 5$ to 2.0 beef per hour. Each conveyor has 12 stations and includes conveyor slots for fat and lean meat running to grinders. The two conveyor
layout was selected in order that front and hind quarters could be broken down on separate tables. For the size of operation envisioned in this study, turn key cost estimates ranged from \$1,250,00 to $\$ 2,000,000$, with an average $\$ 1,625,000$. Once the specific type of cuts are identified, a more specific cost estimate can be determined.

The total plant equipment cost is estimated to be:

$$
\begin{array}{ll}
\cdot \text {-Kill Floor } & =\$ 169,051.00 \\
\cdot \text { Fabrication Floor } & =\$ 1,625,000.00 \\
\cdot \text { Total Equipment Cost } & =\$ 1,794,051.00
\end{array}
$$

Depreciation: Using straight-line depreciation:

| - assets basis | $=$ | $1,794,051.00$ |
| :--- | :--- | :---: |
| - useful life | $=$ | 10 years |
| - salvage value | $=$ | $1,345,538.00^{1}$ |
| - depreciable basis | $=$ | $448,513.00^{2}$ |
| - annual depreciation | $=$ | $44,851.30^{3}$ |
| - accumulated depreciation |  | $448,513.00$ |
| - book value (end of 10th year) | $=$ | $1,345,538.00^{4}$ |

Obviously, the processing plant represents the largest initial investment of the project. A breakdown of each component of the initial plant setup is given. Each component is amortized over a 20 year period at $8 \%$.

[^0]| EXPENDITURE | AMOUNT |
| :---: | :---: |
| 1. Land (100 acres @ 100/acre) | \$10,000 |
| 2. Building, includes kill floor and boning room | \$1,766,690 |
| 3. Mechanical Work (heating, plumbing, etc) | \$1,000,800 |
| 4. Electrical | \$695,000 |
| 5. Equipment | \$1,794,051 |
| 6. Refrigeration | \$865,970 |
| 7. Miscellaneous Equipment | \$269,660 |
| 8. Site-working and Paving | \$41,700 |
| 9. Sewage Hook-up | \$18,070 |
| 10. Water Hook-up and Storage | \$44,480 |
| 11. Engineering | \$133,440 |
| Subtotal | \$6,639,861 |
| Interest During ${ }^{\text {Construction }}$ <br> Year 1 <br> Year 2 | $\begin{aligned} & \$ 265,594 \\ & \$ 265,594 \end{aligned}$ |
| Contingency | \$663,986 |
| Soliciting Investment | \$264,100 |
| Construction Supervision | \$150,120 |
| Grand Total | \$8,249,255 |

[^1]| EXPENDITURE | AMOUNT | AMORTIZED ANNUAL ${ }^{\text {a }}$ |
| :---: | :---: | :---: |
| 1. Land (100 acres @ 100/acre) | \$10,000 | \$1087.32 |
| 2. Building, includes kill floor and boning room | \$1,766,690 | \$192,104.90 |
| 3. Mechanical Work (heating, plumbing, etc) | \$1,000,800 | \$108,824.17 |
| 4. Electrical | \$695,000 | \$86,343.14 |
| 5. Equipment | \$1,794,051 | \$195,080.00 |
| 6. Refrigeration | \$865,970 | \$94,163.00 |
| 7. Miscellaneous Equipment | \$269,660 | \$29,322.00 |
| 8. Site-working and Paving | \$41,700 | \$4,534.00 |
| 9. Sewage Hook-up | \$18,070 | \$1,964.82 |
| 10. Water Hook-up and Storage | \$44,480 | \$4,836.65 |
| 11. Engineering | \$133,440 | \$14,509.95 |
| Subtotal | \$6,639,861 | \$732,769.95 |
| Interest During ${ }^{\text {Construction }}$ <br> Year 1 <br> Year 2 | $\begin{aligned} & \$ 265,594 \\ & \$ 265,594 \end{aligned}$ | \$57,759.91 |
| Contingency | \$663,986 | \$72,199.82 |
| Soliciting Investment | \$264,100 | \$28,171.52 |
| Construction Supervision | \$150,120 | \$16,323.58 |
| Grand Total | \$8,249,255 | \$907,224.78 |

${ }^{\text {a }}$ Amortized a $8 \%$ interest over a 20 year period.

Estimates for the other fixed consts include:
Property
Taxes
For the Millard County site, the property tax obligation is determined by multiplying the tax rate time 80 percent of the assessed market value. Land that might be used for the plant site could be obtained for approximately $\$ 100$ per acre. For 100 acres this is $\$ 10,000 @ 80 \%$ is $\$ 8,000.00 * .014644=\$ 117.15$

Insurance: Cost should range from 0.75/1000-1.00/1000 on machinery and buildings, for approximately $\$ 5,000$ per year.

Management
Cost:
A $320 \mathrm{hd} /$ per day kill is estimated to cost approximately $\$ 306,000$, which is $33 \%$ more than that paid for a 150 head per day plant.

## Variable Costs

Variable costs include power, labor, etc.

| Cost item | $150 \mathrm{hd} /$ per day ${ }^{\mathrm{b}}$ | $320 \mathrm{hd} /$ per day $^{\mathrm{c}}$ | Cost per pound $^{\mathrm{d}}$ |
| :--- | :--- | :--- | :--- |
| Utility Cost | $\$ 28.75$ per hour | $\$ 38.32$ | $\$ .002$ |
| Combo Bins | 9.00 per bin | 9.00 per bin | $\$ .03$ |
| Processing Labor | $\$ 475.00$ per hour | $\$ 633.00$ per hour | $\$ .0344$ |
| Water | $\$ 3.33$ per hour | $\$ 4.42$ per hour | $\$ .00024$ |
| Cull Cows | $* * * * * * * * * * *$ | $* * * * * * * * * * *$ | $\$ .41$ |

${ }^{\text {a }}$ Need to assume the difference between a $150 \mathrm{hd} /$ per day operation and $320-350 \mathrm{hd} /$ per day is about a $1 / 3$ more.
${ }^{\mathrm{b}}$ This is "turn-key" figure from a conversation with Dale Smith of Dale Smith Packing.
${ }^{\mathrm{c}}$ The desired production level is $400 \mathrm{hd} /$ per day; 320 represent the plant at $80 \%$ capacity.
${ }^{\text {d }}$ At $80 \%$ capacity the should produce 129,043 pds boneless meat/day or $14,338 \mathrm{pds} /$ per hour @ 9 hour day.

## Feasibility

## Revenue

The revenue side of the packing business comprises the following revenue producing components of the animal:

- carcass
- boneless meat from front quarter
- boneless meat from hind quarter
- bone for bonemeal
- blood for bloodmeal
- edible and inedible tallow
- hide
- offal
- beef tongue
- cheek meat
- oxtails
- beef heart
- kidneys
- liver
- lips
- tripe (stomach lining)
- sweet breads
- feet

A $47 \%$ dress-out was used to figure the carcass weight. So, for a 1100 pound animal we have 517 pounds of carcass weight. The USDA requirements ${ }^{5}$ show a $500-600$ pound carcass should "bone-out" with 250-300 pounds per side. Each side should have 104-125 pounds per front-quarter and 90-108 pounds per hind-quarter. The front quarter bones-out at $42 \%$ and hind at $36 \%$ with $22 \%$ as bone for bone-meal.

For a 517 pound carcass we have
boneless front-quarter
first front
second front
total front quarter
108.57 pounds
108.57 pounds
217.14 pounds
${ }^{5}$ USDA (1988) Institutional Meat Purchase Specification For Fresh Beef Agricultural Marketing Service; USDA, Washington, D.C.
boneless hind-quarter
first hind $\quad 93.06$ pounds
second hind $\quad 93.06$ pounds
total hind quarter $\quad 186.12$ pounds
bones
first side
56.87 pounds
second side
56.87 pounds
total bones
113.74 pounds

Revenue from the carcass is:

| Front Quarter | 217.14 pounds $* 1.10^{6}$ per pound $=\$ 238.85$ |
| :--- | ---: |
| Hind Quarter | 186.12 pounds $* 1.10$ per pound $=\$ 204.73$ |
| Total boneless meat revenue $=\$ 443.58$ |  |
| Bone for bonemeal | 113.74 pounds $* .09^{7}$ per pound $=\$ 10.24$ |
| Total bonemeal revenue $=$ | $\$ 10.24$ |
| Total revenue from carcass $=\$ 453.82 / \mathbf{a n i m a l}$ |  |

The price per pound is slightly higher than the national average ${ }^{8}$ as shown in Figure 1

[^2]

Figure 1. National Meat Prices

Because of the variability of pounds per animal for offal, including speciality meats listed above, the hide and offal revenue is figured from a average composite price. The $47 \%$ dress-out leaves $53 \%$ of the animal for hide and offal. On a 1100 pound animal this is 583 pounds. So the revenue from hide and offal is 583 pounds $* .08648=\$ 50.41$, where the data for hide and offal is shown in Figure 2.


Figure 2. Hide And Offal Prices

For annual revenue we have:
$\$ 453.82$ (carcass revenue) * projected per head @ day kill of $320=\$ 145,222.00$
then, carcass revenue is $\$ 145,222 * 12=\$ 1,742,664.00$
$\$ 50.41$ (hide and offal revenue) * projected per head @ day kill of $320=\$ 16,131.20$
Total annual revenue ${ }^{9}$ is $\$ 1,936,243$.

[^3]Table . Costs for a 400 Head Per Day Cull Cow Slaughter and Fabrication Plant.

| Item | Total | Annualized |
| :---: | :---: | :---: |
| Land | 300,000 | 28,104 |
| Building | 1,802,837 | 168,888 |
| Mechanical Work | 1,100,800 | 103,122 |
| Electrical | 695,000 | 65,107 |
| Equipment | 2,300,000 | 215,461 |
| Refrigeration | 865,970 | 81,123 |
| Misc. Equipment | 270,000 | 25,293 |
| Site-work/Paving | 42,000 | 3,935 |
| Holding Pens/Equipment | 140,000 | 13,115 |
| Sewage Hook-up | 18,000 | 1,686 |
| Water Hook-up | 45,000 | 4,216 |
| Engineering | 135,000 | 12,647 |
|  | 7,714,607 | 722,695 |
| Interest During Construction |  |  |
| Year 1 | 308,584 | 28,908 |
| Year 2 | 333,271 | 31,220 |
| Contingency | 771,461 | 72,269 |
| Investment Solicitation | 0 | 0 |
| Construction Supervision | 200,000 | 18,736 |
| Grand Total | 9,327,923 | 873,828 |
| PUC/400 Head/Day |  | 0.373 |
| PUC/800 Head/Day |  | 0.192 |
| Depreciation |  |  |
| Building | 1,802,837 |  |
| Mechanical Work | 1,000,800 |  |
| Electrical | 695,000 |  |
| Refrigeration | 580,000 |  |
| Misc. Equipment | 270,000 |  |
| Holding Pens/Equipment | 140,000 |  |
|  | 2,917,614 |  |
| Straight Line (25 Years) | 116,705 | 116,705 |
|  |  |  |
| Equipment | 2,300,000 |  |
|  | 575,000 |  |
| Straight Line (10 years) | 57,500 | 57,500 |
|  |  |  |


| Management |  | 310,000 |
| :--- | :--- | ---: |
| Insurance |  | 5,218 |
| Property Tax |  | 112,973 |
| Total of All Annualized Fixed Costs |  | $1,476,223$ |
| Fixed Cost/360 Head Per Day |  | 0.630865 |
| Fixed Cost/700 Head Per Day |  | 0.324445 |
| Fixed Cost/Pound Meat (360) |  | 0.0019 |
| Fixed Cost/Pound Meat (700) |  | 0.0010 |
|  |  |  |


[^0]:    ${ }^{1}$ Based on the equipment losing $1 / 4$ of the value over 10 years.
    ${ }^{2}$ Asset basis - salvage value.
    ${ }^{3}$ Depreciable basis $\div$ useful life.
    ${ }^{4}$ Assets basis - accumulated depreciation.

[^1]:    ${ }^{\text {a }}$ Assuming 2 year construction period at $8 \%$ per year.

[^2]:    ${ }^{6}$ The 1.10 figure is a turn-key figure from Dale Smith and Sons Draper Utah.
    ${ }^{7}$ Based on \$163.80/ton from Livestock Market News week ended December 24, 1994
    ${ }^{8}$ Obtained from Cattle-Fax week ending March 30, 1995

[^3]:    ${ }^{9}$ The blood-meal revenue is not part of this total revenue figure because of unavailable data.

