TAURUS

Least Cost and Ration Analysis Programs
for Beef Cattle
Version Number 2014
Regional Software Dissemination Site: USA

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**How to Install?**

1. Insert the Taurus CD into the CD-Rom drive.
2. Using your Windows Explorer, navigate to the CD and you will see a file called Setup.exe:

   ![Setup.exe](setupexe.png)

3. Double click Setup.exe. The Welcome dialog box appears:

   ![Welcome dialog box](welcome.png)

   **Welcome to the InstallShield Wizard for Taurus 2014 USA**

   The InstallShield(R) Wizard will install Taurus 2014 USA on your computer. To continue, click Next.

   ![Next button](next.png)

   Click the Next button.
4. The License Agreement dialog box appears:

Accept the terms in the license agreement and click the Next button.

5. The Customer Information dialog box appears:

Enter your name and your organization and click the Next button.
6. The “Ready to Install the Program” dialog box appears:

![Image of the Ready to Install the Program dialog box]

Click the Install button.

7. The wizard will install the Taurus program on your computer. It may take SEVERAL minutes:

![Image of the Ready to Install the Program dialog box on the next page]
8. Finally, the final dialog box appears:

Click the Finish button. The wizard finishes the installation and will place a shortcut to Taurus on your desktop. It also adds the Taurus to your program menu.

9. It will create a folder called "C:\Program Files\UCDAVIS\TAURUS2014" and will place the taurus.exe file plus the demo.tau ration file in that folder.
**Taurus folder**

All Taurus files are stored in the following folder:
C:\Program Files\UCDAVIS\TAURUS2014\n
**Ration Files**

All Taurus ration files have the .TAU extension and are stored, by default, in the above folder.

**Feed Library Files**

There are four feed library files: (1) TAUSTD.DBF, standard feed library; (2) TAUALT.DBF, alternate feed library; (3) TAUGRP.DBF, feed group library; (4) TAUINF.DBF, infeasible feed library. These files are stored in the C:\Program Files\UCDAVIS\TAURUS2014\ folder.

**Taurus Manual**

The Taurus manual, Taurus.pdf, is stored in the Taurus folder. To view and print this file, you need Adobe Acrobat Reader. You can get a free copy of this software by visiting the following web site:

http://www.adobe.com/products/acrobat/readstep2.html

The Taurus order form, OrderForm.pdf, is also in the same folder
How to Run?

1. Click the Start button and then choose the “All Programs”. A menu list appears.
2. Choose the “UCDAVIS” option. A sub-menu appears.
3. Choose the “TAURUS2014” option. Another sub-menu appears. Choose the “Launch Taurus.exe” option. The sign-on banner of Taurus appears. Click the OK button. The main menu of Taurus appears:

Choose the “Least Cost Ration: Growing or Finishing Cattle” option. The Animal Information dialog box appears:
4. Animal Information dialog box:

From the "Files" menu, choose the "Open" option. Navigate to C:\Program Files\UCDAVIS\TAURUS2014\ folder. Open the Demo.Tau ration file.

Click the [>] (Next Button). The Nutrient Constraints dialog box appears.
5. The Nutrient Constraints dialog box:

Here you can click the “ReCalc” button to populate this dialog box with a set of default constraints. You can add, delete or modify any or all of these constraints.

After you are done. Click the Next button. The Feed List Dialog box appears.
6. The Feed List dialog box:

You can add, edit, or delete feeds. You can specify feed price and assign a min or max amount on a feed. You can also edit the nutrient analysis of a feed. These changes remain local to this ration file and will not reflect back to feed libraries. After you are done, click the Next button. The Group Constraints dialog box appears.
7. The Group Constraints dialog box:

<table>
<thead>
<tr>
<th>GROUP No</th>
<th>Name</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROUGHAGES</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td>CONCENTRATES</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>4</td>
<td>Dry forage, roughage</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>5</td>
<td>Energy feeds</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>6</td>
<td>Protein supplements</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>7</td>
<td>Mineral supplements</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>10</td>
<td>By-products</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>11</td>
<td>Fat and oils</td>
<td>2.0000 %DM</td>
<td>6.0000 %DM</td>
</tr>
<tr>
<td>12</td>
<td>Molasses</td>
<td>0.0000</td>
<td>10.0000 %DM</td>
</tr>
<tr>
<td>13</td>
<td>Real Feeds</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
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<td>0.0000</td>
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<td>0.0000</td>
<td>0.0000</td>
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<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

You can specify a min or max for feed groups. When you are done, click the next button. The Ratio Constraints dialog box appears.
8. The Ratio Constraints dialog box:

You can specify a min or max to the ratio of any two nutrients, or any two feeds, or any two feed groups.

When you are done click the Formulate button. The program will enter the formulation mode and will formulate the ration and will show the output dialog box.
9. The Output Screen

By clicking the Next button you can view the following screens:
Cost, Performance, and Methane Emission
Ration Composition
Price Ranges / Feeds Not Used
Nutrient Analysis Detailed information about feeds

You can also view the results for all feeds or for a specific feed group on 100% DM basis or on AS Fed basis.

You can also print the output or go back to the input screens and modify some entries and re-formulate the ration.
COFIGURATION AND CUSTOMIZATION

The Taurus program has four configuration files:

1. COMPANY.CFG    To configure the heading for all printouts.
2. TAUSETUP.CFG   To configure user-defined nutrients.
3. PPIMPLAN.CFG   To configure implant effects in Profit Projection module.
4. PPCLSOUT.CFG   To configure the format of the closeout report in Profit Projection module.

WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING WARNING !!!!!!

Please copy these files in another folder, such as C:\BACKUP\ as backup. This is very important. Because if you mess up any of these configuration files, you will be able to restore them by copying the configuration files from the backup folder onto the main folder for this application.

DO NOT EDIT ANY OF THESE CONFIGURATION FILES WITHOUT MAKING BACKUPS!!!!!!

1. COMPANY.CFG

This file is used to configure the heading for all printouts. This is a text file. It is located in the main folder for this application. Do not use Microsoft Word to open this file. Use Notepad program to edit it. This file has originally the following content:

+-----------------------------------------------------------------------+ | California Beef Cattle Ranch                                          | | One Shields Avenue, Davis, CA 95616                                  | | Phone:(530)752-1278 FAX:(530)752-0175 http://animalscience.ucdavis.edu | +-----------------------------------------------------------------------+

This file has exactly four lines. Each line has exactly 78 characters. The first line shows the name of your company. The second line shows your address. The third line shows your phone, fax, email, and web address. The fourth line must be blank to keep a blank line between the heading and the body of printouts. Use space bar to center the text. Do not use tab.

You must re-start the program for your modification to take effect.

2. TAUSETUP.CFG

This file is used to configure user-defined nutrients. This is a text file. It is located in the main folder for this application. Do not use Microsoft Word to open this file. Use Notepad program to edit it. This file has originally the following content:

+---------------------------------------------------------------+ |*COMMENTS                                                       | | The NUTIENTS section has four columns: NO, CODE, NAME, and CLASS: | | | | | NO - Maximum width of this column is two digits. Do not change these numbers: 43, 44, 45, and 46. | | | CODE - Maximum width of this field is four characters. User upper case letters. Enter an abbreviation for your nutrient, for example IRON or PROT | | | NAME - Maximum width of this column is 12 characters. Enter a description for your nutrient. | | | CLASS - Maximum width of this column is one digit. Enter a number between 1 and 5 in this field to specify the unit for your nutrient. The class of a nutrient can be be one of the following: | | | 1 = {%} | | 2 = {Mcal/lb or Mcal/kg} | +---------------------------------------------------------------+
3 = {IU/lb or IU/kg}  
4 = {ppm}  
5 = {Unit/lb or Unit/kg}  
6 = {k IU/lb or k IU/kg}

There should be a comma between columns and all values must be aligned.

The PAGE HEADING section has a single line. The maximum width of page heading is 31 characters. Enter a description for your user-defined nutrients.

<table>
<thead>
<tr>
<th>NO CODE NAME</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>43, NUT1, User Nut 1, 1</td>
<td></td>
</tr>
<tr>
<td>44, NUT2, User Nut 2, 1</td>
<td></td>
</tr>
<tr>
<td>45, NUT3, User Nut 3, 1</td>
<td></td>
</tr>
<tr>
<td>46, NUT4, User Nut 4, 1</td>
<td></td>
</tr>
</tbody>
</table>

This file has three sections: COMMENTS, NUTRIENTS, and PAGE HEADING. The Comments section shows how to modify the other two sections. You must re-start the program for your modification to take effect.

3. PPIMPLAN.CFG

This file is used to configure implant effects in Profit Projection module. This is a text file. It is located in the main folder for this application. Do not use Microsoft Word to open this file. Use Notepad program to edit it.

This file has originally the following content:

+--------------------------------------------------------------------------+
| 0, -14, -8                  |
| 1, -12, -7                  |
| 2, -9, -6                   |
| 3, -6, -4                   |
| 4, -3, -2                   |
| 5, 0, 0                     |
| 6, 1, 1                     |
| 7, 2, 2                     |
| 8, 3, 3                     |
| 9, 4, 4                     |

The PPIMPLAN.CFG file consists of three columns and 10 rows of information.

The first column contains a scale of 0-9, 5 being the NRC standard. Any number below 5 will reduce intake and gain. Any number above 5 will increase intake and gain.

The second column has the intake adjustments (for example, -14% adjustment for those non-implanted animals, or with "0" implant).

The third column is the maintenance requirement adjustment (for example, the same non-implanted animal, would be adjusted -8% maintenance requirement.

For those of you who do not find these predefined adjustments appropriate, by changing the numbers in the intake and maintenance adjustment columns, the program will use the adjustments that you specify in this file. You must re-start the program for your modification to take effect.

4. PPCLSOUT.CFG

This file is used to configure the format of the closeout report in Profit Projection module. This is a text file. It is located in the main folder for this application. Do not use Microsoft Word to open this file. Use Notepad program to edit it.
Save a copy of the current configuration file (PPCLSOUT.CFG) under a different name (i.e. PPCLSOUT.OLD) this way if you make a mistake with the new configuration, you can just copy the PPCLSOUT.OLD into PPCLSOUT.CFG and define the new configuration one more time.

The configuration file consists of item numbers with optional headings. For example, a number 2 on a line by itself instructs the program to print the item number 2 on that same line. Item number 2 is Cattle cost, $ (at auction, etc). If you put number 22 in the next line, this would force the program to print item 22 on the next line, which is Interest on cattle, $.

The following list shows a list of 29 line items. Each line item consists of a number, a description, and two values; one for Total/Lot and the second for Average/Hd.
<table>
<thead>
<tr>
<th>Item</th>
<th>Total/Lot</th>
<th>Avg/Hd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Pay-weight, lb (at auction, etc)</td>
<td>225000.00</td>
<td>450.00</td>
</tr>
<tr>
<td>2 Cattle cost, $ (at auction, etc)</td>
<td>213750.00</td>
<td>427.50</td>
</tr>
<tr>
<td>3 In-weight, lb (upon arrival at lot)</td>
<td>205000.00</td>
<td>410.00</td>
</tr>
<tr>
<td>4 Transit shrink, %</td>
<td>8.89</td>
<td></td>
</tr>
<tr>
<td>5 Feedlot death loss, %</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>6 Finish-Wt, lb (without 4% shrink)</td>
<td>565120.45</td>
<td>1150.96</td>
</tr>
<tr>
<td>7 Net gain, lb (PayWt to PayWt)</td>
<td>317515.63</td>
<td>646.67</td>
</tr>
<tr>
<td>8 Total head.days &amp; Avg days-on-feed</td>
<td>135185.00</td>
<td>275.33</td>
</tr>
<tr>
<td>9 ADG, lb</td>
<td>2.35</td>
<td></td>
</tr>
<tr>
<td>10 Total feed as fed, lb</td>
<td>2044924.92</td>
<td>4164.82</td>
</tr>
<tr>
<td>11 Daily feed as fed</td>
<td>7427.29 lb/day</td>
<td>15.13</td>
</tr>
<tr>
<td>12 Feed efficiency, lb as fed/lb gain</td>
<td>4.44</td>
<td></td>
</tr>
<tr>
<td>13 Feed costs, $</td>
<td>142537.82</td>
<td>290.30</td>
</tr>
<tr>
<td>14 Feed costs per lb gain, $/lb</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>15 Medical charges, $</td>
<td>7500.00</td>
<td>15.27</td>
</tr>
<tr>
<td>16 Other feedlot costs, $</td>
<td>1693.95</td>
<td>3.45</td>
</tr>
<tr>
<td>17 Total feedlot charges with interest, $</td>
<td>156721.59</td>
<td>319.19</td>
</tr>
<tr>
<td>18 Feedlot cost of gain, $/lb</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>19 Total sale, $</td>
<td>401461.57</td>
<td>817.64</td>
</tr>
<tr>
<td>20 Average sale price, $/cwt</td>
<td>74.00</td>
<td></td>
</tr>
<tr>
<td>21 Laid-in costs, $</td>
<td>227270.00</td>
<td>462.87</td>
</tr>
<tr>
<td>22 Interest on cattle, $</td>
<td>10087.83</td>
<td>20.55</td>
</tr>
<tr>
<td>23 Interest on feedlot, $</td>
<td>4989.82</td>
<td>10.16</td>
</tr>
<tr>
<td>24 Interest (cattle+feedlot), $</td>
<td>15077.65</td>
<td>30.71</td>
</tr>
<tr>
<td>25 Total costs (with all interests), $</td>
<td>394079.42</td>
<td>802.61</td>
</tr>
<tr>
<td>26 Profit/(Loss), $</td>
<td>7382.14</td>
<td>15.03</td>
</tr>
<tr>
<td>27 Breakeven sell, $/cwt</td>
<td>72.64</td>
<td></td>
</tr>
<tr>
<td>28 Breakeven buy, $/cwt</td>
<td>102.76</td>
<td></td>
</tr>
<tr>
<td>29 Out-Wt, lb (with 4% shrink)</td>
<td>542515.63</td>
<td>1104.92</td>
</tr>
</tbody>
</table>

Select the numbers from this list and type them in the PPCLSOUT.CFG file. By rearranging item numbers you can create your own groups of items. You can also type optional headings for each group of items. These headings should not start with a number. Use letters such as A, B, C, D, E, or F to start the headings. For example, A. PURCHASES

Note - If you do not have a configuration file (PPCLSOUT.CFG) the program lists items 1-29 in ascending order as it is shown in the above list. You must re-start the program for your modification to take effect.
PRINTOUTS

The program creates various text files for printouts. Although these are not used in configuration or customization of the program, but you can open them in your text editor and reformat and print them as you wish. These files will be constantly overwritten by the program, so save them under different names to keep them from being overwritten by the program.

You can use a text editor, such as notepad or Microsoft word to open these text files. Please, Use "Courier New" font to keep the spacing and alignment. Do not use "Times New Roman" or "Arial" or any other font.

Printout for Ration Formulation and Devaluation

Each time you print the formulation or evaluation of a ration, the program creates a text file which contains the same information as in the printout. This text file is called PRINTOUT.TXT and is located in the main folder of the application.

Printout for Loading and Unloading

Each time you run the delivery module and print the output, the program creates a series of text files, which contain the same information as the printouts. These files are located in the main folder of the application.

HEADT.LST - This contains the loading or unloading heading.
BODY.LST - This contains the loading or unloading printout

Printout for Profit Projection

Each time you run the Profit Projection module and print the output, the program creates a series of text files, which contain the same information as the printouts. These files are located in the main folder of the application.

PPCLSOUT.LST - This contains the closeout report.
PPINPUT.LST - This contains the General Information
PPITERHEAD.LST - This file contains heading for iteration information.
PPITER.LST - This file contains iteration information. You can import this file into Microsoft Excel and graph the profit projection curve for the entire period.
There are four kinds of animal information dialog boxes:

### Animal Information Dialog Box for Least Cost Ration: Growing or Finishing Cattle

<table>
<thead>
<tr>
<th>Title line 1:</th>
<th>Date:</th>
<th>Weight Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Science Dept, UC Davis</td>
<td>01/11/2014</td>
<td>lb</td>
</tr>
<tr>
<td>Beginning Body Weight: 700.00 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ending Body Weight: 1100.00 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Gain: 1.00 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead cost ($/day): 0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed Intake Adjustment (+/-): 0.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Adjustment (+/-): 0.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition Score: Below Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensatory Growth? (Y/N): No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breed: English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame: Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implant: Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additive: None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp: Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mud: None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Animal Information Dialog Box for Least Cost Ration: Breeding Cattle

<table>
<thead>
<tr>
<th>Title line 1:</th>
<th>Date:</th>
<th>Weight Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo</td>
<td>01/11/2014</td>
<td>lb</td>
</tr>
<tr>
<td>Beginning Body Weight: 700.00 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ending Body Weight: 1100.00 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Gain: 1.00 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhead cost ($/day): 0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed Intake Adjustment (+/-): 0.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance Adjustment (+/-): 0.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition Score: Below Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensatory Growth? (Y/N): No</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breed: English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frame: Medium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implant: Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additive: None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp: Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mud: None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Animal Information dialog box for Ration Evaluation: Growing or Finishing Cattle

Animal Information dialog box for Ration Evaluation: Breeding Cattle
This is a general help message for the animal information screen in the following modules:

LC_G    Least Cost Ration for Growing or Finishing Cattle
LC_B    Least Cost Ration for Breeding Cattle
EVAL_G  Ration Evaluation for Growing or Finishing Cattle
EVAL_B  Ration Evaluation for Breeding Cattle

Most of the following fields are common to all four modules, but some of the fields may be present in one module but not in others.

TITLE
-----
Enter a name and/or address or other identification for your ration on these two lines. This title will be displayed at the top of all printed output for this ration.

WT UNIT
-------
You may choose to enter data using either the English or the metric system.

Enter lb to display all input and output in English units.
Enter kg to display all input and output in metric units.

The program will automatically convert any data already entered to the unit selected.

BEGINNING BODY WEIGHT
----------------------
The body weight at the beginning of feeding phase.

The weight is based on the live shrunk body weight. It is defined as weight after an overnight feed and water shrink (generally equivalent to about 96 percent of unshrunk weights taken in the early morning). Usually equivalent to feedlot's In-Weight.

ENDING BODY WEIGHT
------------------
The desired body weight at the end of feeding phase.

The weight is based on the live shrunk body weight. It is defined as weight after an overnight feed and water shrink (generally equivalent to about 96 percent of unshrunk weights taken in the early morning). Usually equivalent to feedlot's selling pay-weight.

DAILY GAIN
--------
The average daily gain per animal per day during feeding phase.
For the pregnant cows and heifers do not include the fetal gain which is 0.9 lb/day (0.4 kg/day). For pregnant females specify maternal gain which is about 0 - 1 lb/day (0 - 0.45 kg/day).

Live gain is usually equivalent to feedlot's gain from in-weight to selling-pay-weight.
DAILY OVERHEAD COST
----------------------
The nonfeed costs per head per day (dollars).

SEX
---
Enter Steer, Heifer, Bull, or Cow.

BREED
-----
Enter English, Holstein, Exotic, Brahman, or Other.

AGE
---
Enter Calf, Yearling, or Adult.

FRAME
-----
Enter Medium, or Large.

Frame score describes the skeletal size of cattle. Frame score depends on age, hip height, and nutrition level.

CONDITION SCORE
-----------------
Enter 1 through 9.

Condition score relates to the degree of fatness.

1 = Emaciated
5 = Average
9 = Very fat

COMPENSATORY GROWTH
----------------------
Enter Yes or No.

Adjustment for accelerated growth following a period of limited feed intake.

FEED INTAKE ADJUSTMENT
-----------------------
Due to certain feeding situations (ration quality, type of cattle, etc.), it may be necessary to adjust the total estimated consumption of the ration without regard of different ingredients.

An entry of "0" leaves the estimated consumption unadjusted.
An entry of -20 means that the animals will eat 20% less than normal.
An entry of +15 implies that the animals will eat 15% more than normal.

MAINTENANCE ADJUSTMENT
------------------------
Due to climate, type of cattle, etc., it may be necessary to adjust the Net Energy required for Maintenance (NEm, Mcal/day).

An entry of "0" leaves the estimated NEm unadjusted.
An entry of -20 means that the animals requires 20% less than normal.
An entry of +15 implies that the animals requires 15% more than normal.

LEAST COST GAIN
----------------
If you answer 'Yes', the program, automatically, formulates for the optimum rate of gain which minimizes the cost per unit of gain. In this mode, you can not put constraints on four nutrients: Net Energy for Maint, Crude protein, Calcium, and Phosphorus. You also can not specify the amount of Dry Matter, but you can specify its percentage.
SEX
---
Enter Heifer, Bull, or Cow.

MILK PRODUCTION
---------------
Daily milk production expressed as kg/day or lb/day. The normal range is 5 - 10 Kg/day.

MILK FAT
--------
Percent fat in milk. Normal range is 3 - 6 %

Calf Birth Weight
-----------------
Expected birth weight of calf expressed in kg or lb.

DAYS PREGNANT
-------------
Days after conception. Gestation period is 285 days.

FEED IMPLANT
------------
None - use of feed implant reduces the voluntary intake of cattle by -8% and increases the NEm_req by 8%.

FEED ADDITIVE
-------------
Feed additive effects the energy requirement and voluntary intake of cattle:

<table>
<thead>
<tr>
<th>Feed Additive</th>
<th>NEm_req</th>
<th>Feed Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monensin @ 30g/ton diet</td>
<td>-10 %</td>
<td>-10 %</td>
</tr>
<tr>
<td>Monensin @ 20g/ton diet</td>
<td>- 8 %</td>
<td>- 6 %</td>
</tr>
<tr>
<td>Lasalocid in diet</td>
<td>- 8 %</td>
<td>- 2 %</td>
</tr>
</tbody>
</table>

TEMPERATURE
------------
Temperature effects the voluntary intake of cattle:

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Feed Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Stress: Above 95 F (35 C) with no night cooling</td>
<td>-5 %</td>
</tr>
<tr>
<td>Normal: From 41 - 95 F (5 - 35 C)</td>
<td>0 %</td>
</tr>
<tr>
<td>Cold Stress: Below 41 F (5 C)</td>
<td>+5 %</td>
</tr>
</tbody>
</table>

MUD
---
Mud effects the voluntary intake of cattle:

<table>
<thead>
<tr>
<th>Mud Type</th>
<th>Feed Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild mud: 4 - 8 inches (10 - 20 cm)</td>
<td>-15 %</td>
</tr>
<tr>
<td>Severe mud: 12 - 24 inches (30 - 60 cm)</td>
<td>-30 %</td>
</tr>
</tbody>
</table>
NUTRIENT CONSTRAINTS LIST

The nutrient constraints are calculated based on the animal information. If you change any value in the animal information dialog box, the program recalculates the nutrient constraints. You can also click the “ReCalc” button to recalculate the constraints. If you select the Least Cost Gain option, the nutrient constraint list must be empty; if it is not, then click the “ReCalc” button to clean up the constraints list.

NUTRIENT CONSTRAINTS

<table>
<thead>
<tr>
<th>No</th>
<th>Code</th>
<th>Name</th>
<th>MIN Amount Unit</th>
<th>MAX Amount Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DM</td>
<td>Dry Matter</td>
<td>19.421 lb</td>
<td>19.421 lb</td>
</tr>
<tr>
<td>2</td>
<td>NEM</td>
<td>Net Energy for Maint</td>
<td>0.585 Mcal/lb</td>
<td>0.585 Mcal/lb</td>
</tr>
<tr>
<td>3</td>
<td>CP</td>
<td>Crude Protein</td>
<td>7.792 %</td>
<td>0.000</td>
</tr>
<tr>
<td>4</td>
<td>CA</td>
<td>Calcium</td>
<td>0.224 %</td>
<td>2.000 %</td>
</tr>
<tr>
<td>5</td>
<td>P</td>
<td>Phosphorus</td>
<td>0.179 %</td>
<td>1.000 %</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>8</td>
<td></td>
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<td>0.000</td>
<td>0.000</td>
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<tr>
<td>9</td>
<td></td>
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<td>0.000</td>
<td>0.000</td>
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<tr>
<td>10</td>
<td></td>
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<td>0.000</td>
<td>0.000</td>
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<tr>
<td>11</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>12</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>15</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>16</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>17</td>
<td></td>
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<td>0.000</td>
<td>0.000</td>
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<tr>
<td>18</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
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<tr>
<td>19</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Nutrient Constraints list

The nutrient constraints displayed on this page have been calculated based upon the animal information already entered on the previous page. If you wish to change any of these constraints, you may as follows:

To ADD a constraint: Move your cursor to a blank line and click the [Add] button. A dialog box appears. Enter your new nutrient constraint and then click the [OK] button.

To EDIT a constraint: Move your cursor to the line containing the constraint and click the [Edit] button. A dialog box appears. Modify the existing constraint and then click the [OK] button.

To DELETE a constraint: Move your cursor to the line containing the constraint and click the [Delete] button.
To regenerate default NRC nutrient constraints, click the [ReCalc] button. This will replace all nutrient constraints which you may have changed previously. Alternatively, any change in the Animal Information screen, such as changing the animal weight, will have the same effect as clicking the [ReCalc] button.

**Edit Existing Nutrient Constraints**

**Nutrient Constraints**

- **Code**: CA
- **Name**: Calcium
- **Minimum**: 0.222
- **Maximum**: 2.000

**CODE**

This column contains the nutrient codes.

**NAME**

This column contains the nutrient names.

The following is a list of nutrients and their abbreviations:

- DE: Digestible energy
- ME: Metabolizable Energy
- NEM: Net Energy for Maint
- NEG: Net Energy for Gain
- TDN: Total Digestible Nut
- CP: Crude Protein
- UIP: Undegrad Intake Prot
- DIP: Degrad Intake Prot
- NPN: Non Protein Nitrogen
- EE: Ether Extract
- ASH: Ash
- CF: Crude Fiber
- CELL: Cellulose
- ADF: Acid Detergent Fiber
- NDF: Neutral Det Fiber
- NCHO: NonStruct Carbohyd
- HC: Hemicellulose
- LIGN: Lignin
- CA: Calcium
- VITA: Vitamin A
- VITD: Vitamin D
- VITE: Vitamin E
- ARG1: Arginine
- LYSI: Lysine
- METH: Methionine
- PHEN: Phenylalanine
- TRHE: Threonine
- NUT1: User Nut 1
- NUT2: User Nut 2
- NUT3: User Nut 3
- NUT4: User Nut 4

**MINIMUM**

This column contains the minimum amount of the selected nutrient that will be included in the ration. It also displays the type of minimum constraint.
This column contains the maximum amount of the selected nutrient that will be included in the ration. It also displays the type of maximum constraint.
FEED LIST

---

**FEED LIST** dialog box

---

**NAVIGATION**

- **[Files]**: Create, open, or save ration.
- **[<]**: Previous screen.
- **[Goto]**: Jump to another input section.
- **[>]**: Next screen.
- **[Feed Analysis]**: View or edit nutrient analysis of feed.
- **[Add]**: Add new feed.
- **[Edit]**: Edit existing feed.
- **[Dbl Click]**: Double click on a row in the list box invokes Edit button.
- **[Delete]**: Delete existing feed.
- **[Price Unit]**: Select the feed price unit.
- **[Help]**: Display help message.
- **[Formulate]**: Formulate ration.
- **[Main Menu]**: Exit and return to main menu

---

**ADDING FEED**

---

When you add a feed from the standard or alternate feed libraries to your ration data file, a separate copy of that feed will be added to your ration data file.

Change in the feed in your ration data file does not reflect back to the feed in the feed library. Change in the feed in the feed library does not reflect back to the feed in your ration data file. These two feeds remain independent from each other.

When you add a new feed, make sure to set its fourth feed group to 13, which specifies the real feeds. This is useful in the output section for viewing only the real feeds and excluding all the infeasible feeds.

---

**LIBRARY CODE**

---

TAURUS 2014: Manual
Enter the set of feeds that you wish to consider for ration formulation into the table on this page. If you are evaluating an existing ration, enter all of the feeds that are in the ration as well as the amounts as fed per day.

To ADD a feed to the list: use the arrow keys to move to a blank line in the table. Then press the <Add> button.

Feed library codes are as follows:
STD - the information for this feed is stored in the standard library of feeds supplied by the program.
ALT - the feed information is contained in an alternate feed library which has been created or modified by you, the program user.
NEW - the feed information is not contained in any existing feed library. You must enter into the program the entire nutrient analysis for a new feed, since the information is not stored anywhere else.

To DELETE a feed from the list: use the arrow keys to move to the line in the table containing the feed that you wish to delete. Remove the feed by pressing the <Delete> button.

To EDIT a feed: move to the line that you want to edit and then press the <Edit> button.

---

FEED NUMBER
---------------------
Each feed in the standard and alternate feed libraries has a unique number assigned to it. If you are entering information for a new feed, you may assign it any number you wish. If you are selecting a feed from one of the existing feed libraries and you do not know its corresponding number, press the arrow in the choice list to get a list of all feed numbers and names in the selected library. You can then use the arrow keys to move to the feed that you want.

FEED NAME
---------------------

Enter a descriptive name for the feed.

**FEED PRICE**

Enter the cost of this feed in the units specified:

- dollars per ton: English ton (= 2000 lb), OR
- cwt: hundred weight (= 100 lb), OR
- met ton: metric ton (= 1000 kg), OR
- kg: kilogram

If you wish to enter the feed price in a unit different from the one specified, press the <Price Unit> button. After you select the desired price unit, the program will automatically convert any data already entered to the unit selected.

**MINIMUM AMOUNT**

You can force a feed to be included in the ration by entering a minimum constraint amount. The program will then include at least this amount and maybe more when formulating the ration. After you enter the desired amount, the program will ask you to identify the type of constraint (i.e. percent, lbs) by displaying a menu of choices. Use the arrow keys to move to the desired constraint type, and then press <Enter>.

To delete an existing minimum constraint, enter 0 for the amount.

**MINIMUM UNIT**

Identify the type of minimum constraint by using the arrow keys to move to the desired type. Then press the <Enter> key.

**MAXIMUM AMOUNT**

You can limit the amount of a feed in the ration by entering a maximum constraint on that feed. After you enter the desired amount, the program will ask you to identify the type of constraint (i.e. percent, lbs) by displaying a menu of choices. Use the arrow keys to move to the desired constraint type, and then press <Enter>.

Many of the feeds in the standard feed library have built-in maximum constraints which will automatically be displayed in this column.

To delete an existing maximum constraint, enter 0 for the amount.

**MAXIMUM UNIT**

Identify the type of maximum constraint by using the arrow keys to move to the desired type. Then press the <Enter> key.

**FEED ANALYSIS**

If you wish to view or edit the nutrient analysis for a particular feed, press the <Feed Analysis> button. The program will then display the entire nutrient analysis for the feed.

If you are entering information for a NEW feed, you must fill in the entire nutrient analysis, since the information for a new feed is not already stored in one of the feed libraries.

All changes are local to this particular ration data file and does not change the nutrient analysis of that particular feed in the standard or alternate feed libraries.
Feed Analysis dialog box.

INTERNATIONAL FEED NUMBER
-------------------------------
This field is optional. Common feed stuffs are assigned a 6-digit international feed number (IFN) for identification and computer manipulation. The first digit in the IFN represents the international feed classes:

1. Dry forages and roughages
2. Pasture, range plants, and forage fed fresh
3. Silage
4. Energy feeds
5. Protein supplements
6. Mineral supplements
7. Vitamin supplements
8. Additives

DRY MATTER (PERCENT AS FED)
-----------------------------
The dry matter percentage of a feed is 100 minus the moisture percentage of the feed. If a feed is totally dry, it has 100% dry matter. If, for example, the feed has a 20% moisture content, its dry matter percentage would be 80.

FEED TYPE
-------
Each feed must be classified as either a roughage or a concentrate. Roughages are feeds containing a high amount of fiber, such as alfalfa hay and corn silage. All other feeds are concentrates.

MVI FACTOR
Each roughage feed has a corresponding maximum voluntary intake (MVI) factor (range: 1.0 to 1.4: excellent quality = 1.0, fair quality = 1.4). If an MVI factor for a forage is omitted, the default value = 1.4.

FEED GROUPS
-----------
Each feed may be a member of one or more groups of similar feeds. By placing the feed into a group, you can put constraints on the group of feeds for ration formulation. You can also choose to view the nutrient analysis for a particular feed group in the ration display portion of the program.

All feeds with an identical group number are considered to be members of the same group.

DRY MATTER BASIS
----------------
This field allows you to choose the dry matter basis to use for editing the nutrient analysis of the feed. Most feed nutrient analyses are reported on a 100% dry matter basis. However, if you have nutrient data on other than a 100% dry matter basis, enter the dry matter percentage used for the analysis and corresponding nutrient data, and the program will convert everything to 100% dry matter internally.

If you wish to enter data on an "as fed" basis, enter 0, and the program will insert the correct basis, as fed.
FEED GROUP CONSTRAINTS LIST

-- FEED GROUP LIST --

GROUP NUMBER

This table lists all of the feed groups that have been specified in the feed list.

To ADD a group to the list: You can not add a feed group directly. The programs adds groups automatically when a feed which belongs to that group is added in the previous screen.

To DELETE a group from the list: You can not delete a feed group directly. The programs deletes groups automatically when all feeds which belongs to that group are deleted in the previous screen.

Two exceptions are the pre-defined Roughage and Concentrate groups, which are built in to the program and can never be deleted.

GROUP NAME
Enter a descriptive name for the feed group.

**MINIMUM AMOUNT**

You can force a feed group to be included in the ration by entering a minimum constraint amount. The program will then include at least this amount and maybe more when formulating the ration. After you enter the desired amount, the program will ask you to identify the type of constraint (i.e. percent, lbs) by displaying a menu of choices. Use the arrow keys to move to the desired constraint type, and then press <Enter>.

To delete an existing minimum constraint, enter 0 for the amount.

**MINIMUM UNIT**

Identify the type of minimum constraint by using the arrow keys to move to the desired type. Then press the <Enter> key.

**MAXIMUM AMOUNT**

You can limit the amount of a feed group in the ration by entering a maximum constraint on that group. After you enter the desired amount, the program will ask you to identify the type of constraint (i.e. lbs, percent) by displaying a menu of choices. Use the arrow keys to move to the desired constraint type, and then press <Enter>.

Many of the feed groups in the standard library have built-in maximum constraints which will automatically be displayed in this column.

To delete an existing maximum constraint, enter 0 for the amount.

**MAXIMUM UNIT**

Identify the type of maximum constraint by using the arrow keys to move to the desired type. Then press the <Enter> key.

### Edit Existing Feed Group Constraints dialog box

<table>
<thead>
<tr>
<th>Feed Group</th>
<th>Group Number</th>
<th>Group Name</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Percent</th>
<th>Lbs</th>
<th>TotlBDM</th>
<th>%AF</th>
<th>TotlBAF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat and oils</td>
<td>11</td>
<td></td>
<td>2.0000</td>
<td>6.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Edit Existing Feed Group Constraints dialog box*
RATIO CONSTRAINTS LIST

RATIO TYPE

In this table you can define ratio constraints to be used for ration formulation, or you can simply specify a set of ratios to automatically be calculated by the program when displaying the contents of the ration.

To ADD a ratio to the list: use the arrow keys to move to a blank line in the table and click the <Add> button.

Ratio types are as follows:
- Nut - nutrient ratios
- Fd - feed ratios
- Grp - feed group ratios

To DELETE a ratio from the list: use the arrow keys to move to the line in the table containing the ratio that you wish to delete. Then click the <Delete> button.
To EDIT a ratio: move to the line that you want to edit and then click the <Edit> button.

**Edit Ratio Constraints dialog box**

**NUMERATOR CODE**

Each ratio has two parts: a numerator and a denominator. If, for example, you are defining a calcium to phosphorus ratio, the numerator is calcium and the denominator is phosphorus.

Enter the code for the numerator in this column.

**DENOMINATOR CODE**

Each ratio has two parts: a numerator and a denominator. If, for example, you are defining a calcium to phosphorus ratio, the numerator is calcium and the denominator is phosphorus.

**CONSTRAINT AMOUNT**

You should enter a ratio constraint amount as x.xx to 1, where the x's represent the ratio of the numerator to the denominator. For example, if you want to have twice as much calcium as phosphorus in the ration, you would define a calcium to phosphorus ratio of 2 to 1, where 2 is the number that you would specify for the constraint amount.

If you do not want to enter a constraint for formulation but you do want to have the actual ratio calculated by the program when displaying the contents of the ration, enter 0 for the constraint amount.

**CONSTRAINT UNIT**

Identify the type of ratio constraint by using the arrow keys to move to the desired type. Then press the <Enter> key.
OUTPUT

-------------------------------------------------------------------------
NAVIGATION
-------------------------------------------------------------------------
[Files] Create, open, or save profit projection files.
       The print option is under Files button.
[<] Previous screen.
[Goto] Jump to another output section.
[Db1 Click] Double click on a row in the list box invokes Goto button.
[>] Next screen.
[Combine] Combine feeds in mix. Available only in LC_G and LCB modules.
[Feed Group] Select feed group to display.
[DM Basis] Select dry matter basis.
[Help] Display help message.
[Input] Jump to input screen.
[Main Menu] Exit and return to main menu.
-------------------------------------------------------------------------

COST, PERFORMANCE, AND METHANE EMISSION


COST, PERFORMANCE, AND METHANE EMISSION
This section displays the cost and performance of the ration. It also displays the Methane Emission values. For the cost and performance, the following information is included:

1. Days on feeding phase.
2. Gain for whole phase, per day, and per unit of gain.
3. Feed Intake for whole phase, per day, and per unit of gain.
4. Feed cost for whole phase, per day, and per unit of gain.
5. Feed and overhead cost for whole phase, per day, and per unit of gain.

For the Methane Emission, the following information is included:

1. Methane Emission in MJ/day.
2. Methane Emission in Mcal/day.
3. Methane Emission in g/day.
4. Methane Emission in g/kg Dry Matter Intake or in g/lb Dry Matter Intake.
This section displays the amounts of all feeds used in the ration, or the amounts for a feed group selected by using the <Feed Group> button. The following information is included for each feed used in the ration (or group):

1. The amount of the feed in the ration, lb/day or kg/day, as fed basis.

2. The percentage of the feed in the ration (or group), as fed basis.

3. The amount of the feed in the ration, lb/day or kg/day, on a 100% dry matter basis.

4. The percentage of the feed in the ration (or group), on a 100% dry matter basis.

5. Feed and feed group ratios. If you previously defined any feed or group ratios on the Ratios List, the program will calculate the ratio amounts in the ration (or feed group) and display them in this section. Feed ratios will be displayed only if both feeds are used in the ration (or group). Group ratios are displayed only when viewing the composition of ALL FEEDS in the ration.
PRICE RANGE AND FEEDS NOT USED

This section displays the following information for feeds used in the ration:

1. The amount of each feed in the ration, lb/day or kg/day on an as fed basis.

2. The current price of the feed on an as fed basis.

3. The lower range of the feed price. This is the lowest price that the feed can have without affecting its amount used in the ration. If you change the feed to a price below the lower range and then reformulate the ration, the ration composition will change to include more of that feed. Other feeds previously used in the ration may no longer be used. If the lower range is negative, it is not practical to use more of the feed in the ration. If the lower range is -999999.99, the feed amount in the ration cannot be increased due to a maximum constraint on that feed.

4. The upper range of the feed price. This is the highest price that the feed can have without affecting its amount used in the ration. If you change the feed to a price above the upper range and then reformulate the ration, the ration composition will change to include less of that feed, or the feed may be eliminated from the ration. If the upper range is 999999.99, the feed amount in the ration cannot be decreased due to a minimum constraint on that feed.

For feeds NOT USED in the ration, this section displays the following:

1. The current price of the feed on an as fed basis.

2. The opportunity price of the feed. This is the price that the feed must drop to in order for it to be used in the ration. If you add a feed with a price of $10000 per cwt to the feed list and then
formulate the ration, the feed will not be included unless it contains some necessary nutrient that is not available from any other feed. If the feed is not used, it would become a good buy if its cost were less than or equal to the opportunity price.
NUTRIENT ANALYSIS OF THE RATION (OR FEED GROUP)

This section displays information for all feeds in the ration, or for a feed group selected by using the <Feed Group> button. The following information is included:

1. **Amount and type.** Two lines are displayed for each nutrient: line 1 is the CONCENTRATION (percent, ppm, Mcal/lb, etc.) of the nutrient. Line 2 is the AMOUNT (lb, kg, Mcal, etc.) of the nutrient contained in the ration or in a selected feed group.

2. **NRC recommendation.** This is the nutrient amount recommended by the National Research Council. These amounts are calculated internally by the program, based upon the data that you supplied on the Animal Information page. Not all NRC amounts are used as constraints for ration formulation. By comparing the NRC recommendation with the actual amount of the nutrient in the ration (or selected feed group), you can determine if the ration (or feed group) is deficient in that particular nutrient.

3. **Nutrient ratios.** If you previously defined any nutrient ratios on the Ratios list, the program will calculate the ratio amounts in the ration (or feed group) and display them in this section.

If you have just formulated a ration, you will also see the following:

4. **Minimum and maximum constraints.** These are the constraints which were used by the program when the ration was formulated. The displayed nutrient constraints do not apply to any selected feed groups within the ration: they are constraints on ALL feeds.

By clicking the <DM Basis> button, you can change the dry matter basis for calculation of the nutrient analysis. The dry matter basis affects
the concentration of the nutrients, but not the actual amounts or ratios of nutrients in the ration (or feed group). The nutrient constraints and the NRC minimum requirements are also affected by the dry matter basis if they represent nutrient concentrations and not actual amounts or ratios.
This section displays the nutrient analysis for all feeds that you have selected to be in your feed list.

By pressing the <DM Basis> button, you can change the dry matter basis for calculation of the nutrient analysis. Enter 0 to calculate the analysis for all feeds on an as fed basis.

If an asterisk (*) appears in any column, the nutrient amount for the feed in question is too large to be printed inside that column. You can view the actual amount by looking at the nutrient analysis within the feed list page in the input section of this program.
**DELIVERY MODULE**

**DELIVERY MODULE: GENERAL INFORMATION**

Delivery Module: General Information dialog box.

---

### NAVIGATION

- **[Files]** Create, open, or save ration.
- **<]** Previous screen.
- **[Goto]** Jump to another input section.
- **[>]** Next screen.
- **[Help]** Display help message.
- **[Show Sched]** Display schedules.
- **[Main Menu]** Exit and return to main menu

---

### TITLE

Enter a name and/or address or other identification for your ration on these two lines. The title will be displayed at the top of all printed output for this ration.

### Wt Unit

You may choose to enter data using either the English or the metric system.

Enter **lb** to display all input and output in English units.

Enter **kg** to display all input and output in metric units.

The program will automatically convert any data already entered to the unit selected.

### LOADING SCHEDULE TYPE

You may choose to calculate the loading schedules based upon
the total number of animals to be fed OR the total amount of feed (lb or kg per feeding per day) to be added to the mix. Total feed amounts do NOT include feeds in the ration that are fed separately from the mix.

If all feeds in the ration are to be fed separately (there is no mix to be created), the total amount (lb or kg) that you enter on this line will correspond to the total amount of feeds fed separately (lb or kg per feeding per day).

**FEED LOADING MINIMUM AMOUNT**

Feed loading schedules are calculated for a range of the total number of animals to be fed. Enter the minimum number of animals to be fed on this line (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the minimum amount of mix to be created (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).

**FEED LOADING MAXIMUM AMOUNT**

Feed loading schedules are calculated for a range of the total number of animals to be fed. Enter the maximum number of animals to be fed on this line (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the maximum amount of mix to be created (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).

**FEED LOADING INCREMENT**

Feed loading schedules are calculated for a range of the total number of animals to be fed. Enter the number of animals that you want to use as an increment for calculating each of the schedules (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the increment for the total amount of mix to be created (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).

The program will calculate a maximum of twelve schedules.

**UNLOADING SCHEDULE TYPE**

You may choose to calculate the unloading schedules based upon the total number of animals to be fed OR the total amount (lb or kg per feeding per day) to be unloaded from the mix. Total amounts do NOT include feeds in the ration that are fed separately from the mix.

If all feeds in the ration are to be fed separately (there is no mix feed), the total amount (lb or kg) that you enter on this line will correspond to the total amount of feeds fed separately (lb or kg per feeding per day).

**FEED UNLOADING MINIMUM AMOUNT**

Feed unloading schedules are calculated for a range of the total number of animals to be fed. Enter the minimum number of animals to be fed on this line (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the minimum amount of mix to be unloaded (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).

**FEED UNLOADING MAXIMUM AMOUNT**

Feed unloading schedules are calculated for a range of the total number of animals to be fed. Enter the maximum number of animals to be fed on this line (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the maximum amount of mix to be unloaded (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).
of animals to be fed. Enter the maximum number of animals to be fed on this line (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the maximum amount of mix to be unloaded (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).

FEED UNLOADING INCREMENT
------------------------
Feed unloading schedules are calculated for a range of the total number of animals to be fed. Enter the number of animals that you want to use as an increment for calculating each of the schedules (range: 0 to 45000 animals).

If you have specified lb or kg instead of animals as the schedule type, enter the increment for the total amount of mix to be unloaded (lb or kg per feeding per day; range: 0 to 45000 lb, or 0 to 20400 kg).

The program will calculate a maximum of twelve schedules.

MIX FEEDS: NUMBER OF FEEDINGS PER DAY
--------------------------------------
Enter the number of times per day that the animals are to be given ration feeds included in a mix (range: 1 to 9 feedings per day).

ROUNDING FACTOR FOR SCALE WEIGHTS
---------------------------------
Enter the rounding factor used to display the scale weights in the loading and unloading schedules. You have the following choices for rounding factors:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rounding</th>
<th>Unit Display</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>nearest</td>
<td>one lb (kg)</td>
<td>(158.347 displays as 158)</td>
</tr>
<tr>
<td>10</td>
<td>nearest</td>
<td>ten lb (kg)</td>
<td>(158.347 displays as 160)</td>
</tr>
<tr>
<td>0.1</td>
<td>nearest</td>
<td>tenth lb (kg)</td>
<td>(158.347 displays as 158.3)</td>
</tr>
<tr>
<td>0.01</td>
<td>nearest</td>
<td>hundredth lb (kg)</td>
<td>(158.347 displays as 158.35)</td>
</tr>
</tbody>
</table>
DELIVERY MODULE: FEED LIST

---

**NAVIGATION**

- **[Files]** Create, open, or save ration.
- **[<]** Previous screen.
- **[Goto]** Jump to another input section.
- **[>]** Next screen.
- **[Feed Analysis]** View or edit nutrient analysis of feed.
- **[Add]** Add new feed.
- **[Edit]** Edit existing feed.
- **[Db1 Click]** Double click on a row in the list box invokes Edit button.
- **[Delete]** Delete existing feed.
- **[Help]** Display help message.
- **[Show Schdl]** Display loading and unloading schedules.
- **[Main Menu]** Exit and return to main menu

---

**LIBRARY CODE**

Enter the set of feeds that you wish to consider for ration formulation into the table on this page. If you are evaluating an existing ration, enter all of the feeds that are in the ration as well as the amounts as fed per day.

To ADD a feed to the list: use the arrow keys to move to a blank line in the table. Then press the <Add> button.

Feed library codes are as follows:

- **STD** - the information for this feed is stored in the standard library of feeds supplied by the program.
- **ALT** - the feed information is contained in an alternate feed library which has been created or modified by you, the program user.
- **NEW** - the feed information is not contained in any existing feed
library. You must enter into the program the entire nutrient analysis for a new feed, since the information is not stored anywhere else.

To DELETE a feed from the list: use the arrow keys to move to the line in the table containing the feed that you wish to delete. Remove the feed by pressing the <Delete> button.

To EDIT a feed: move to the line that you want to edit and then press the <Edit> button.

FEED NUMBER
------------
Each feed in the standard and alternate feed libraries has a unique number assigned to it. If you are entering information for a new feed, you may assign it any number you wish. If you are selecting a feed from one of the existing feed libraries and you do not know its corresponding number, press the arrow in the choice list to get a list of all feed numbers and names in the selected library. You can then use the arrow keys to move to the feed that you want.

FEED NAME
--------
Enter a descriptive name for the feed.

FEEDING METHOD
---------------
Enter one of following feeding methods:

Mix - this feed will be included in a mix
Sep - this feed will fed separately from the mix
Both - a portion of this feed will be included in the mix; the rest will be fed separately

AMOUNT IN RATION
----------------
You can edit the actual amount of the feed in the ration and thus change the content and nutrient analysis of the ration.

You should enter all feed amounts on an as fed basis, lbs or kgs per day.

FEED ANALYSIS
--------------
If you wish to view or edit the nutrient analysis for a particular feed, press the <Feed Analysis> button. The program will then display the entire nutrient analysis for the feed.

If you are entering information for a NEW feed, you must fill in the entire nutrient analysis, since the information for a new feed is not already stored in one of the feed libraries.

All changes are local to this particular ration data file and does not change the nutrient analysis of that particular feed in the standard or alternate feed libraries.

INTERNATIONAL FEED NUMBER
---------------------------
This field is optional. Common feed stuffs are assigned a 6-digit international feed number (IFN) for identification and computer manipulation. The first digit in the IFN represents the international feed classes:

1. Dry forages and roughages
2. Pasture, range plants, and forage fed fresh
3. Silage
4. Energy feeds
5. Protein supplements
6. Mineral supplements
7. Vitamin supplements
8. Additives

DRY MATTER (PERCENT AS FED)
---------------------------
The dry matter percentage of a feed is 100 minus the moisture percentage of the feed. If a feed is totally dry, it has 100% dry matter. If, for example, the feed has a 20% moisture content, its dry matter percentage would be 80.

FEED TYPE
---------
Each feed must be classified as either a roughage or a concentrate. Roughages are feeds containing a high amount of fiber, such as alfalfa hay and corn silage. All other feeds are concentrates.

MVI FACTOR
----------
Each roughage feed has a corresponding maximum voluntary intake (MVI) factor (range: 1.0 to 1.4: excellent quality = 1.0, fair quality = 1.4). If an MVI factor for a forage is omitted, the default value = 1.4.

FEED GROUPS
------------
Each feed may be a member of one or more groups of similar feeds. By placing the feed into a group, you can put constraints on the group of feeds for ration formulation. You can also choose to view the nutrient analysis for a particular feed group in the ration display portion of the program.

All feeds with an identical group number are considered to be members of the same group.

DRY MATTER BASIS
----------------
This field allows you to choose the dry matter basis to use for editing the nutrient analysis of the feed. Most feed nutrient analyses are reported on a 100% dry matter basis. However, if you have nutrient data on other than a 100% dry matter basis, enter the dry matter percentage used for the analysis and corresponding nutrient data, and the program will convert everything to 100% dry matter internally.

If you wish to enter data on an "as fed" basis, enter 0, and the program will insert the correct basis, as fed.
DELIVERY MODULE: MIX FEED LIST

Delivery Module: Mix Feed List dialog box.

NAVIGATION

[Files] Create, open, or save ration.
[<] Previous screen.
[Goto] Jump to another input section.
[>] Next screen.
[Edit] Edit mix amount.
[Db1 Click] Double click on a row in the list box invokes Edit button.
[Up] Move up existing feed.
[Dn] Move down existing feed.
[Help] Display help message.
[Show Schdl] Display loading and unloading schedules.
[Main Menu] Exit and return to main menu.

LIBRARY CODE

Feed library codes are as follows:

STD - the information for this feed is stored in the standard library of feeds supplied by the program.
ALT - the feed information is contained in an alternate feed library which has been created or modified by you, the program user.
NEW - the feed information is not contained in any existing feed library. You must enter into the program the entire nutrient analysis for a new feed, since the information is not stored anywhere else.

FEED NUMBER

Each feed in the standard and alternate feed libraries has a unique number assigned to it.
FEED NAME
---------
Each feed has a descriptive name.

AMOUNT IN RATION
-----------------
This field shows the actual amount of the feed in the ration.

AMOUNT IN MIX
-------------
Enter the amount of this feed that is to be included in the mix.

You should enter all feed amounts on an as fed basis, lbs or kgs per day.

ORDER IN MIX
-------------
The order in mix specifies the order that this feed is to be loaded onto the mixer.

Press the <Up> button to move up the feed in the list. Press the <Dn> button to move down the feed in the list.
DELIVERY MODULE: SEPARATE FEED LIST

Delivery Module: Separate Feed List dialog box.

-------------------------------
**NAVIGATION**
-------------------------------
[Files] Create, open, or save ration.
[<] Previous screen.
[Goto] Jump to another input section.
[>] Next screen.
[Edit] Edit separate amount.
[Db1 Click] Double click on a row in the list box invokes Edit button.
[Help] Display help message.
[Show Schdl] Display loading and unloading schedules.
[Main Menu] Exit and return to main menu

**LIBRARY CODE**

Feed library codes are as follows:
- STD - the information for this feed is stored in the standard library of feeds supplied by the program.
- ALT - the feed information is contained in an alternate feed library which has been created or modified by you, the program user.
- NEW - the feed information is not contained in any existing feed library. You must enter into the program the entire nutrient analysis for a new feed, since the information is not stored anywhere else.

**FEED NUMBER**

Each feed in the standard and alternate feed libraries has a unique number assigned to it.

**FEED NAME**

Each feed has a descriptive name..
AMOUNT IN RATION
-----------------
This field shows the actual amount of the feed in the ration.

AMOUNT FED SEPARATELY
----------------------
Enter the amount of this feed that is to be fed separately from the mix.

You should enter all feed amounts on an as fed basis, lbs or kgs per day.
DEVELOPMENT MODULE: OUTPUT

---------------------------------------------------------------------------------------------------------------------
NAVIGATION
---------------------------------------------------------------------------------------------------------------------
[Files] Create, open, or save profit projection files.
        The print option is under Files button.
[<] Previous screen.
[Goto] Jump to another output section.
[Dbl Click] Double click on a row in the list box invokes Goto button.
[>] Next screen.
[Feed Group] Select feed group to display.
[Help] Display help message.
[Input] Jump to input screen.
[Main Menu] Exit and return to main menu.
---------------------------------------------------------------------------------------------------------------------
LOADING SCHEDULE

---------------------------------------------------------------------------------------------------------------------
Delivery Module: Loading Schedule.

This section displays the loading schedules for all feeds used in the ration, or for a feed group selected by using the <Feed Group> button.

Loading schedules are displayed for both mix feeds and feeds fed separately from the mix. A maximum of twelve schedules will be printed.

For each feed fed separately, the schedule shows the amount to be fed at each feeding.

For each feed in the mix, the schedule shows the actual amount of the feed to be added to the mixer, along with the mixer scale reading that will be obtained after the feed has been added. Mix feeds are added in the order that you previously specified on the Mix Feed List form.
UNLOADING SCHEDULE
------------------

Delivery Module: Unloading Schedule.

This section displays the unloading schedules for all feeds used in the ration, or for a feed group selected by using the <Feed Group> button.

Unloading schedules are displayed for the mix feed, along with all feeds fed separately from the mix. A maximum of twelve schedules will be printed.

For each feed fed separately and for the mix, the schedule shows the amount to be unloaded for each feeding.

The number of feedings per day is displayed in parentheses after the amount to be unloaded.
FEEDTAG

FEEDTAG dialog box.

NAVIGATION

[Defaults] Set the input fields to default values.
[Help] Display help message.
[Calculate] Calculate energy values.
[Main Menu] Exit and return to main menu.

FEEDTAG utilizes a feed group category and user specified proximate analyses values for crude protein, ether extract, ash and crude fiber. Based on this chemical analyses and a regression equation for that group, FEEDTAG calculates a value for digestible energy content of the feed. FEEDTAG then derives values for metabolizable energy, total digestible nutrients, net energy for maintenance, net energy for gain and net energy for lactation from this digestible energy value (NRC, 1984). The program displays all the energy values for the feed in question on the screen.

Feeds are grouped into five categories based on their International Feed Number, with the exception of forages (group 1), which were further divided into legumes and non-legumes.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>General</td>
</tr>
<tr>
<td>B</td>
<td>Dry forage and roughage: Legumes</td>
</tr>
<tr>
<td>C</td>
<td>Dry forage and roughage: Non legumes</td>
</tr>
<tr>
<td>D</td>
<td>Pasture and range plants</td>
</tr>
<tr>
<td>E</td>
<td>Silage</td>
</tr>
<tr>
<td>F</td>
<td>Energy feeds</td>
</tr>
<tr>
<td>G</td>
<td>Protein supplements</td>
</tr>
</tbody>
</table>
FEEDTAG INPUT

In the input screen you will enter all of the information (feed group, crude protein, etc) that is required to estimate the energy contents of the feed. The input screen consists of the following fields:

FEED NAME
Enter the name of the feed that you wish to calculate energy values for.

FEED GROUP
Each feed group has its own equation for estimating energy values. So, be careful in selecting your group. If you are not sure choose Group A (General).

DRY MATTER
If you want to enter the chemical analysis on the 100 % D.M. basis, enter 100 in this field. Usually the chemical analysis values on the feed tags are on as fed basis, in this case you would enter the dry matter contents of the feed (for example 90%) in this field. In either case the program will give you the energy contents of the feed on a 100% dry matter basis.

CRUDE PROTEIN
Enter the crude protein contents of the feed (%).

NPN PROTEIN EQUIVALENT
Enter the Non-Protein Nitrogen contents of the feed.

FAT OR OIL (E.E.)
Enter the ether extract contents of the feed (%).

ASH
Enter the ash contents of the feed (%).

CRUDE FIBER
Enter crude fiber contents of the feed (%).

FEEDTAG OUTPUT

Press the “Calculate” button and the program calculates the energy values of the feed. The FEEDTAG output is shown at the bottom right corner of the input screen. It consists of energy values: DE Mcal/lb., ME Mcal/lb, NEm Mcal/lb, NEg Mcal/lb, TDN %, and ME1 Mcal/lb. All energy values are on 100 % dry matter basis.

At this time you can print the output by holding down the Alt key and pressing the PrtSc (print screen) key.

The methods used for predicting energy values of feedstuffs are based in regression equations developed from data obtained from digestibility studies. These prediction equations were developed based on chemical analysis and regression equations. The program calculates energy values, using the following algorithm:

Step 1. Converts all values to 100% DM basis.

Step 2. Calculates Digestible Energy, Mcal/kg, for different groups:

Grp A: DE= 3.916828-0.00812 *CP+0.04554 *EE-0.0176 *ash-0.0422 *CF
Grp B: DE= 2.811904+0.0209413*CP+0.006492 *EE+0.01302*ash-0.0274 *CF
Grp C: DE= 3.264743+0.06363 *CP-0.0761 *EE-0.0508 *ash-0.0283 *CF
Grp D: DE= 3.723255+0.002459 *CP+0.0815818*EE-0.01302*ash-0.0274 *CF
Grp E: DE= 4.706482-0.0158 *CP+0.034633 *EE-0.0241 *ash-0.0598 *CF
Grp G: DE= 3.729697+0.008047 *CP+0.04582 *EE-0.0328 *ash-0.0284 *CF

Step 3. Corrects for Non Protein Nitrogen Protein Equivalent:
DE = DE * (1-(CP * NPN/28200))

Step 4. All other energy values are calculated by using DE.
Metabolizable Energy, Mcal/kg:
ME = 0.82 * DE

Net Energy for Maintenance, Mcal/kg:
NEM = 1.37 * ME - 0.138 * ME * ME + 0.0105 * ME * ME * ME - 1.12

Net Energy for Gain, Mcal/kg:
NEG = 1.42 * ME - 0.147 * ME * ME + 0.0122 * ME * ME * ME - 1.65

Total Digestible Nutrients, %:
TDN = 100 * (DE/4.4)

Net Energy for Lactation, Mcal/kg:
NEL = 0.0245 * TDN - 0.12

Step 5. The Energy values finally are converted to the user-specified system (English or Metric).
PROFIT PROJECTION MODULE

PROFIT PROJECTION will allow the user to, under user's specified parameters, project the performance (i.e. financial) of a cattle feeding operation. The program takes this pre-specified information (i.e. CATTLE TYPE, CATTLE COST, CATTLE PRICE, FEEDING INFORMATION, etc.) and with the use of PROJECTION MODELS (i.e. OLTLJEN'S INTAKE MODEL, NRC'S GAIN MODEL, etc.) it PROJECTS the financial performance of the enterprise. PROFIT PROJECTION creates a CLOSE-OUT REPORT containing financial and other performance information in an easy to use and understand format, offering also the option to customize the reports.

PROFIT PROJECTION INPUT

The input section consists of three screens: General Information Screen, Phase Screen, and Calendar Screen. The General Information Screen contains information about breed, frame and sex, as well as purchasing and selling price. The Phase Information Screen contains data about the rations used in the feeding phases. The Calendar Screen contains seasonal adjustments in feed intake and maintenance requirements.

GENERAL INFORMATION SCREEN

Profit Projection: General Information dialog box.

NAVIGATION

[Files] Create, open, or save profit projection files.
[<] Previous screen.
[Go to] Jump to another input section.
[>] Next screen.
[Help] Display help message.
[Output] Run simulation and project profit.
[Main Menu] Exit and return to main menu.

---------------------------------

TITLE
-------
Enter a name and/or address or other identification for your profit projection on these two lines.

WEIGHT UNIT
-------------
You may choose to enter data using either the English or the metric system.

Enter 1b to display all input and output in English units.
Enter kg to display all input and output in metric units.

The program will automatically convert any data already entered to the unit selected.

The weight unit in the Profit Projection module is independent of weight unit in the formulation and evaluation modules.

BREED
-----
Enter English, Holstein, Exotic, Brahman, or Other. The breed is used to adjust intake and gain equations. If you select the Other breed, these adjustments will be ignored.

FRAME
-----
Enter Small, Medium, or Large. You can use the minus and plus signs to indicate the intermediate values: Small, Small-, Small+.

Frame score describes the skeletal size of cattle and depends on age, hip height, and nutrition level.

SEX
---
Enter Steer, Heifer or Bull.

FEED IMPLANT
-------------
Enter a number from 0 to 9. The value 5 indicates the NRC standard. Values below 5 will reduce intake and gain and values above 5 will increase intake and gain. The default adjustments are contained in a text file called PPIMPLAN.CFG. This file can be modified by using a text editor such as Notepad. Do not use Microsoft Word or any other word processor that formats the text.

The current values are as follows:

<table>
<thead>
<tr>
<th>Implant Number</th>
<th>%Intake</th>
<th>%Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-14</td>
<td>-8</td>
</tr>
<tr>
<td>1</td>
<td>-12</td>
<td>-7</td>
</tr>
<tr>
<td>2</td>
<td>-9</td>
<td>-6</td>
</tr>
<tr>
<td>3</td>
<td>-6</td>
<td>-4</td>
</tr>
<tr>
<td>4</td>
<td>-3</td>
<td>-2</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

INITIAL CONDITION SCORE
----------------------
Enter 1 through 9.

Condition score relates to the degree of fatness.

1 = Emaciated
5 = Average
9 = Obese

IN DATE
-------
Enter the month, day and year of the starting day of the projection.

HEAD IN
-------
Number of head of cattle received at feedlot. The default is 100 heads.

PAY WEIGHT
----------
Purchase weight of animals, lb/head or kg/head.

IN WEIGHT
---------
Weight of animals on arrival, lb/head or kg/head. The difference between purchase weight and in-weight is the shrinkage-in.

PURCHASE PRICE
---------------
Purchase cost, $/cwt.

COMMISSION BUY
--------------
Fee involved in buying the cattle, $/head.

TRANSIT
-------
Cost of transporting cattle to feedlot, $/head.

ORIGIN INSPECTION FEE
---------------------
Inspection fee at origin or in transit, $/head.

PASTURE MOVEMENT FEE
---------------------
Fees for inspecting cattle when moving to pasture, $/head.

SELLING PAY WEIGHT
--------------------
Weight of animals on departure from feedlot WITH shrinkage.

SHRINKAGE OUT
-----------
Percent shrinkage after leaving feedlot. Usually 4%.

SELLING PRICE
---------------
Estimated selling price of the cattle, $/cwt.

COMMISSION SELL
----------------
Fee involved in selling the cattle, $/cwt.

BRAND INSPECTION FEE
---------------------
Fee involved for brand inspection, $/head.

BEEF CHECK OFF FEE
-------------------
Fee for beef research and beef promotion, $/head.
MARGIN (EQUITY)
-------------
Investment in cattle on which no interest is charged, $/head.

INTEREST RATE
-------------
Cost of borrowing money for cattle and feed. Percent per year, such as 9% or 12%, etc.

DEATH LOSS (1-21 DAYS)
-----------------------
Death loss that occurs during the first 21 days of feeding period. The default value is 1.50 percent.

DEATH LOSS (22+ DAYS)
---------------------
Death loss that occurs after 21 days. The default value is 0.50 percent.

PROC-MEDICAL COST
-------------
Processing and medical costs including implants, $/head.

MGT/YARDAGE FEE
-------------
Cost of management and yardage of the cattle. Cent/head.day.

OTHER FEES
---------
Other costs that occur in feeding the cattle, $/head.

PHASE
-----
You can have up to five feeding phases.

NET GAIN METHOD
--------------
There are three different methods for calculating Net Gain:

1. High Plain Method: From Pay-Weight to Pay-Weight.
   This is used by customers and shows actual number.
2. Southern California Method: From In-Weight to Pay-Weight.
   This is used by feedlot operators and shows a higher number.
3. Scientific Method: From In-Weight to Finish-Weight.
   This is used by university people and shows a very high number.

The default is the SPA standard Pay-Weight to Pay-Weight method.

INTAKE EQUATION
--------------
Select the equation for calculating daily intake. There are six equations: Oltjen, NRC, Plegge, Fox, Thornton, and Gill.

The NRC intake equation is that given in the NRC (1984) publication. It adjust intake so that daily gain is constant.

OLTJEN was developed for young cattle fed in California feedlots. The PLEGGE equation fits calves and yearling fed in the Upper Midwest, usually part corn silage diets. It is not useful for light calves, giving abnormally low intakes.

FOX is a general purpose equation, based on adjustments for a wide range of situations.

THORNTON and GILL are equations for feedlot cattle, and were developed in High Plains feedlots.
The GILL equation is more sensitive to the weight of the cattle when put on feed.

THORNTON should only be used with yearlings.

GAIN EQUATION
-------------
Select the equation for calculating daily gain of cattle. There are three equations: NRC 1984, NRC 1976, and Oltjen et al. (1986). The Oltjen equation also predicts quality and yield grades.

SHOW DAILY PROFIT
------------------
Enter Y to show daily profit, breakeven to sell and selling price during iteration. This will slow down the program, but you can determine when is best to sell the cattle. Selling price will be determined using a sliding scale from initial purchase price to final selling price.
## PHASE INFORMATION

Profit Projection: Phase Information dialog box.

### NAVIGATION

- **[Files]** Create, open, or save profit projection files.
- **<** Previous screen.
- **[Goto]** Jump to another input section.
- **[>]** Next screen.
- **[Edit]** Edit phase information
- **[Dbl Click]** Double click on a row in the list box invokes Edit button.
- **[Help]** Display help message.
- **[Output]** Run simulation and project profit.
- **[Main Menu]** Exit and return to main menu.

Click the <Edit> button to edit the phase information.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Ration Name</th>
<th>Intake as %</th>
<th>Fd Cost S/ton</th>
<th>Days</th>
<th>wt lb</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RECEIVE</td>
<td>1.30%</td>
<td>85.00</td>
<td>7</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>GROW</td>
<td>1.85%</td>
<td>100.00</td>
<td>14</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>FINISH</td>
<td>0.00%</td>
<td>110.00</td>
<td></td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>
Edit Phase Information dialog box.

PHASES
------
You can have up to five feeding phases. The number of phases is controlled from the previous screen, General Information Screen. To increase or decrease number of phases, go to previous screen and modify the value of Phases.

RATION NAME
-------------
Enter any name up to eight characters for this ration, for example: RECEIVE, GROW, FINISH.

DRY MATTER
-----------
Percent dry matter of feed.

NEm
---
Net energy for maintenance of ration, Mcal/lb or Mcal/kg on 100% DM basis. If you leave this field as zero, the program will calculate the NEm value using the NEg value.

NEg
---
Net energy for gain of ration, Mcal/lb or Mcal/kg on 100% DM basis. If you leave this field as zero, the program will calculate the NEg value using the NEm value.

FEED COST
---------

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Total feed cost, $/ton or $/m ton.

FEED MARKUP
------------
Extra cost in milling and feeding the ration, $/ton or $/m ton.

FEED WASTE
-----------
Percent of feed that is wasted during the feeding process.

ADDITIVE
--------
Addition of ionophore.

AGE
---
Age of animal, either calf or yearling. Yearlings eat more and exhibit more compensatory gain than calves.

FEED INTAKE PCT
---------------
Feed intake as percent of live body weight on 100% Dry Matter basis. If you enter a value other than zero, it will override the Feed Intake Equation. For example, for an animal with 750 lb live body weight, a value of 1.3% will force in an intake of 9.75 lb/day. If the dry matter of ration is 90%, then feed intake will be 10.83 lb/day on as fed basis.

Use this column for initial phases, when the animals are newly arrived and are recovering from stress.

ENDING WEIGHT
--------------
Pay-Weight of animal at the end of a feeding phase.

ENDING DAYS
------------
Days fed in a feeding phase.

ENDING GRADE
-------------
Quality Grade at the end of feeding phase. This option works only with the Oltjen gain equation, because only the Oltjen model can estimate Percent Fat and Quality Grade is calculated using Percent Fat.

Quality Grade = 2.66 + 0.249 * Percent Fat
Yield Grade = -1.60 + 0.163 * Percent Fat

<table>
<thead>
<tr>
<th>Quality Grade</th>
<th>Name</th>
<th>Quality Grade</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 - 6.499</td>
<td>STD OR&lt;</td>
<td>10.5 -11.499</td>
<td>CHOICE</td>
</tr>
<tr>
<td>6.5 - 7.499</td>
<td>SELECT-</td>
<td>11.5 -12.499</td>
<td>CHOICE+</td>
</tr>
<tr>
<td>7.5 - 8.499</td>
<td>SELECT</td>
<td>12.5 -13.499</td>
<td>PRIME-</td>
</tr>
<tr>
<td>8.5 - 9.499</td>
<td>SELECT+</td>
<td>13.5 -14.499</td>
<td>PRIME</td>
</tr>
<tr>
<td>9.5 -10.499</td>
<td>CHOICE-</td>
<td>14.5 and more</td>
<td>PRIME+</td>
</tr>
</tbody>
</table>
CALENDAR INFORMATION

Profit Projection: Calendar Information dialog box.

------------------------------------------------------------------------
NAVIGATION
------------------------------------------------------------------------
[Files]        Create, open, or save profit projection files.
[<]            Previous screen.
[Goto]         Jump to another input section.
[>]            Next screen.
[Edit]         Edit feed intake adj and maintenance adj.
[Db1 Click]     Double click on a row in the list box invokes Edit button.
[Help]         Display help message.
[Output]       Run simulation and project profit.
[Main Menu]    Exit and return to main menu.
------------------------------------------------------------------------

Click the <Edit> button to edit the calendar information.
Edit Calendar Information dialog box.

FEED INTAKE ADJ
---------------
Percent adjustment of feed intake. Enter values from 1 - 100. For a ten percent increase in intake enter 10.00. For five percent decrease in intake enter -5.00. Usually the intake decreases in the warmer months.

MAINTENANCE ADJ
---------------
Percent adjustment in maintenance requirement. Enter values from 1 - 100. For example for ten percent increase in maintenance requirement enter 10.00. For five percent decrease in maintenance requirement enter -5.00. Usually in the colder months the maintenance requirement increases.
PROFIT PROJECTION OUTPUT

Profit Projection: Closeout Report.

---

---

TAURUS 2014 USA [PRFTPR1]

CLOSE OUT:

California Beef Cattle Ranch
One Shields Avenue, Davis, CA 95616 USA
Phone: (530) 752-1278 FAX: (530) 752-0175 http://animalscience.ucdavis.edu

Demo
University of California, Davis
Date-in 10/26/2014 Date-out 07/02/2015 Period length: 250 days
Head-in 100.00 Head-out 98.00

Total/Lot Avg/Head

A. PURCHASES
Pay-weight, lb (at auction, etc) 45000.00 450.00
Cattle cost, $ (at auction, etc) 42750.00 427.50
In-weight, lb (upon arrival at lot) 41000.00 410.00
Transit shrink, % 0.89
Laid-in Costs, $/cwt 45454.00 103.01 Buy PayWt

B. PERFORMANCE
In-weight, lb (upon arrival at lot) 41000.00 410.00
Feedlot death loss, % 2.00
Met gain, lb (PayWt to PayWt) 63999.00 644.89
Total head days & Avg days on feed 24538.50 250.39
ADG, lb 2.58
Total feed as fed, lb 367785.91 3752.64
Daily feed as fed 1466.73 lb/day 14.95 lb/HD.day
Feed efficiency, lb as fed/lb gain 5.62

C. COSTS
Cattle cost, $ (at auction, etc) 42750.00 427.50
Laid-in costs, $ 45454.00 463.82 Head-Out

---

TAURUS 2014 USA [PRFTPR1]

DAILY TREATMENTS:

California Beef Cattle Ranch
One Shields Avenue, Davis, CA 95616 USA
Phone: (530) 752-1278 FAX: (530) 752-0175 http://animalscience.ucdavis.edu

Live Intake Live Market Selling
Weight DM Gain to Sell Price Profit

Date Day Day lb lb/day lb/day $/cwt $/cwt $/head Grade

10/26/2014 1 410.0 5.54 -0.18 115.52 95.00 -30.72
10/27/2014 2 499.8 5.34 -0.18 115.67 95.00 -31.30
10/28/2014 3 499.6 5.54 -0.18 115.83 95.00 -31.88
10/29/2014 4 499.5 5.34 -0.18 115.99 95.00 -32.46
10/30/2014 5 499.3 5.53 -0.18 116.14 95.00 -33.04
10/31/2014 6 499.1 5.53 -0.18 116.06 95.00 -33.62
11/01/2014 7 499.9 5.53 -0.18 116.22 95.00 -34.20

**** PHASE CHANGE

11/02/2014 8 408.7 7.86 1.18 118.04 95.00 -90.65
11/03/2014 9 409.9 7.09 1.18 117.85 95.00 -90.20
11/04/2014 10 411.1 7.91 1.18 117.67 95.00 -89.74
11/05/2014 11 412.3 7.93 1.18 117.50 95.00 -89.29
11/06/2014 12 412.5 7.95 1.19 117.32 95.00 -88.84
11/07/2014 13 414.6 7.99 1.19 117.14 95.00 -88.39
11/08/2014 14 415.8 8.00 1.19 116.96 95.00 -87.93
11/09/2014 15 417.0 8.02 1.19 116.79 95.00 -87.47
11/10/2014 16 418.2 8.05 1.19 116.61 95.00 -87.02
11/11/2014 17 419.4 8.07 1.20 116.44 95.00 -86.56
11/12/2014 18 420.6 8.09 1.20 116.27 95.00 -86.11
11/13/2014 19 421.8 8.12 1.20 116.09 95.00 -85.65
11/14/2014 20 423.0 8.14 1.20 115.92 95.00 -85.20
11/15/2014 21 424.2 8.16 1.20 115.75 95.00 -84.74

**** PHASE CHANGE
Profit Projection: Daily Iterations.
The output consists of two screens: Closeout screen and Iterations screen.

The iterations screen shows the result of daily iterations. The values in the closeout screen are calculated according to the following equations:

1. Pay-weight: Purchase weight of animals.
2. In-weight: Weight of animals on arrival in feedlot.
3. Finish-weight: Weight of animals on departure from feedlot.
   \[ \text{FinishWeight} = \frac{\text{LiveWeight}}{0.96} \]
4. Out-weight: Weight of animals on departure from feedlot with shrinkage. Equivalent to selling pay weight.
   \[ \text{OutWeight[HD]} = \text{FinishWeight[HD]} \times (1 - \left(\frac{\text{ShrinkageOut}}{100}\right)) \]
   \[ \text{OutWeight[LOT]} = \text{OutWeight[HD]} \times \text{HeadOut} \]
5. Transit Shrink, %:
   \[ \text{ShrinkIn} = 100 \times \left(\frac{\text{PayWeight[HD]} - \text{InWeight[HD]}}{\text{PayWeight[HD]}}\right) \]
6. Feedlot Death loss, %:
   \[ \text{Death Loss % (1-21 days): Killed at day 14.} \]
   \[ \text{Death Loss % (21+ days): Killed at day 60.} \]
   \[ \text{DeathLoss} = 1 - \frac{\text{HeadOut}}{\text{HeadIn}} \]
7. Net Gain, lb:
   There are three methods to calculate Net Gain.
   \[ \text{InWt to FinishWt Method:} \]
   \[ \text{NetGain[LOT]} = \text{FinishWeight[LOT]} - \text{InWeight[LOT]} \]
   \[ \text{InWt to PayWt Method:} \]
   \[ \text{NetGain[LOT]} = \text{OutWeight[LOT]} - \text{InWeight[LOT]} \]
   \[ \text{PayWt to PayWt Method:} \]
   \[ \text{NetGain[LOT]} = \text{OutWeight[LOT]} - \text{PayWeight[LOT]} \]
   \[ \text{NetGain[HD]} = \frac{\text{NetGain[LOT]}}{\text{HeadOut}} \]
8. Total Head.days & Avg days-on-feed:
   \[ \text{RULE: Count the day of arrival, don't count the day they go out (either sale or dead).} \]
   \[ \text{--- Head.Days ---} \]
   \[ \text{HeadDays[LOT]} = \sum \text{Iter[i].Head}, \text{for i = 0 to last iter.} \]
   \[ \text{--- Av. HeadDays/hd OR Av. days-on-feed: ---} \]
   \[ \text{HeadDays[HD]} = \frac{\text{HeadDays[LOT]}}{\text{HeadOut}} \]
9. ADG, lb/day:
   \[ \text{ADG[HD]} = \frac{\text{NetGain[LOT]}}{\text{HeadDays[LOT]}} \]
10. Total Feed Consumed (from daily records) on AS FED basis, lb:
    \[ \text{--- Total Feed Consumed per lot, lb: ---} \]
    \[ \text{TotalFeedConsumedAF[LOT]} = \sum \text{Iter[i].IntakeAF} \times \text{Iter[i].Head}, \text{for i = 0 to last iter} \]
--- Total Feed Consumed per head, lb/hd ---
TotalFeedConsumedAF[HD] = TotalFeedConsumedAF[LOT]/HeadOut.

11. Daily feed consumed on 100% Dry Matter
--- daily feed consumed, lb/day (lot) ---
DailyFeedConsumedAF[LOT] = TotalFeedConsumedAF[LOT] / HeadDays[HD].

--- daily feed consumed, lb/head.day ---
DailyFeedConsumedAF[HDDAY] = TotalFeedConsumedAF[LOT] / HeadDays[LOT].

12. Feed efficiency, lb feed/lb gain
FeedEfficiency[HD] = TotalFeedConsumedAF[LOT] / NetGain[LOT].

13. Feed Cost, from daily record
--- Feed costs, $/lot ---
FeedCost[LOT] = Sum(Iter[i].DailyFeedCostAF * Iter[i].Head).
for i = 0 to last iter.

--- Feed costs, $/hd ---

14. FeedCost per pound of gain, $/lb
FeedCostPerGain[HD] = FeedCost[LOT]/NetGain[LOT].

15. Medical charge, $/lot and $/hd
MedicalCharge[LOT] = HeadIn * ProcMedicalCost.
MedicalCharge[HD] = MedicalCharge[LOT]/HeadOut.

16. Other feedlot costs, $(lot) and $/hd
Sum of ALL feedlot non-feed, non-Medical charges (yardage, inspection fees, etc.). It does NOT include the feedlot interest.
OtherFeedlotCosts[LOT] =
    HeadOut * CommissionSell    +
    HeadOut * BrandInspectionFee +
    HeadOut * BeefCheckoffFee    +
    HeadDays[LOT] * (MgtYardageFee/100) +
    HeadIn * OtherFees.

OtherFeedlotCosts[HD] = OtherFeedlotCosts[LOT] / HeadOut.

17. Total feedlot charges with interest,$(lot) and $/hd
Sum of feed, Medical, other feedlot costs, and Feedlot Interest.
TotalFeedlotCharges[LOT] = FeedCost[LOT]+
    MedicalCharge[LOT] +
    OtherFeedlotCosts[LOT] +
    FeedlotInterest[LOT].

TotalFeedlotCharges[HD] = TotalFeedlotCharges[LOT]/HeadOut.

18. Feedlot Cost of Gain, only $/hd
FeedlotCostOfGain[HD] = TotalFeedlotCharges[LOT]/NetGain[LOT].

19. Total Sale, $ /lot and $/head

20. Avg sale price, $/cwt

21. Cattle cost, $ (at auction, etc)
PurchaseCost[HD] = (PurchasePrice/100) * PurchasePayWeight[HD]
PurchaseCost[LOT] = (PurchasePrice/100) * PurchasePayWeight[LOT]
22. Interest on cattle, $

Note that HeadOut is used for calculating per head value.

\[
\text{CattleLoan[LOT]} = \text{HeadIn} \times \text{PurchasePayWeight} \times \left(\text{PurchasePrice}/100\right) + \\
\text{HeadIn} \times \text{CommissionBuy} + \\
\text{HeadIn} \times \text{Transit} + \\
\text{HeadIn} \times \text{OriginInspectFee} + \\
\text{HeadIn} \times \text{PastureMovementFee} - \\
\text{HeadIn} \times \text{MarginEquity};
\]

\[
\text{CattleInterest[LOT]} = \text{Days} \times \text{CattleLoan[LOT]} \times \text{InterestRate}/36500;
\]

\[
\text{CattleLoan[HD]} = \text{CattleLoan[LOT]}/\text{HeadOut};
\]

\[
\text{CattleInterest[HD]} = \text{CattleInterest[LOT]}/\text{HeadOut};
\]

23. Interest on feedlot, $

Feedlot loan is initialize to medical and other up front from the very first day. Then we iterate for feed cost and yardage. Note that HeadOut is used for calculating per head value.

\[
\text{FeedlotLoan[LOT]} = \text{HeadIn} \times \text{ProcMedicalCost} + \\
\text{HeadIn} \times \text{OtherFees};
\]

\[
\text{FeedlotLoan[LOT]} = \sum_{i=1}^{\text{last iter}} \left(\text{Iter}[i].\text{Head} \times \text{MgtYardageFee} + \right. \\
\left. \text{Iter}[i].\text{Head} \times \text{Iter}[i].\text{DailyFeedCostAF}\right)
\]

\[
\text{FeedlotInterest[LOT]} = \sum_{i=1}^{\text{last iter}} \left(\text{FeedlotLoan[LOT]} \times \text{InterestRate}/36500\right);
\]

\[
\text{FeedlotLoan[HD]} = \text{FeedlotLoan[LOT]}/\text{HeadOut};
\]

\[
\text{FeedlotInterest[HD]} = \text{FeedlotInterest[LOT]}/\text{HeadOut};
\]

24. Interest (cattle+feedlot)

\[
\text{Sum of cattle interest and feedlot interest.}
\]

25. Laid-in costs, $(lot) and $/head

Sum of original cost of cattle, freight, order-buyer charges, at-origin inspection, and all charges PRIOR to arrival

\[
\text{LaidinCosts[LOT]} = \text{PurchaseCost[LOT]} + \\
\text{HeadIn} \times \text{CommissionBuy} + \\
\text{HeadIn} \times \text{Transit} + \\
\text{HeadIn} \times \text{OriginInspectFee} + \\
\text{HeadIn} \times \text{PastureMovementFee}.
\]

\[
\text{LaidinCosts[HD]} = \text{LaidinCosts[LOT]}/\text{HeadOut}.
\]

26. Total Costs (with all interests), $(lot) and $/head

Sum of Laidin cost + All feedlot cost + CattleInterest

\[
\text{TotalCosts[LOT]} = \text{LaidinCosts[LOT]} + \\
\text{TotalFeedlotCharges[LOT]} + \\
\text{CattleInterest[LOT]}.
\]

\[
\text{TotalCosts[HD]} = \text{TotalCosts[LOT]}/\text{HeadOut}.
\]

27. Profit/Loss, $(lot) and $/head

\[
\text{ProfitLoss[LOT]} = \text{TotalSale[LOT]} - \text{TotalCosts[LOT]}.
\]

\[
\text{ProfitLoss[HD]} = \text{ProfitLoss[LOT]}/\text{HeadOut}.
\]

28. Breakeven Sell, $/cwt put in the HD column

\[
\text{BreakevenSell[HD]} = 100 \times \text{TotalCosts[LOT]} / \text{OutWeight[LOT]}.
\]

29. Breakeven Buy, $/cwt put in the HD column

\[
\text{BreakevenBuy[HD]} = 100 \times \\
\left(\text{TotalSale[LOT]} - \\
\left(\text{TotalCosts[LOT]} - \text{PurchaseCost[LOT]} - \text{CattleInterest[LOT]}\right)\right) / \\
\text{PayWeight[LOT]}.
\]
NOTES:

The iteration shows the change in feeding phases as specified in the PHASE INFORMATION SCREEN. It also provides you with useful information (i.e. break-even point, etc) which will help you make important decisions that are critical to the success to your operation.

When running the program, it is recommended to project profits with at least three different scenarios, for example: one keeping the SELLING PRICE equal to previous year, one assuming that it goes up, and one assuming that it goes down. This will provide you with a pessimist and an optimist scenario.

If the results of the calculations do not seem accurate in the iteration or in the close-out report, check the data that you entered in the input screens, it could be that you are missing values, or provided inaccurate information. If that is the case, make the corrections and run the projection one more time.

The program allows you to modify the company logo, implant effect, and the format of the closeout report by modifying three configuration files: COMPANY.CFG, PPIMPLAN.CFG, ands PPCLSOUT.CFG. For more information see Configuration and Customization section of this manual.