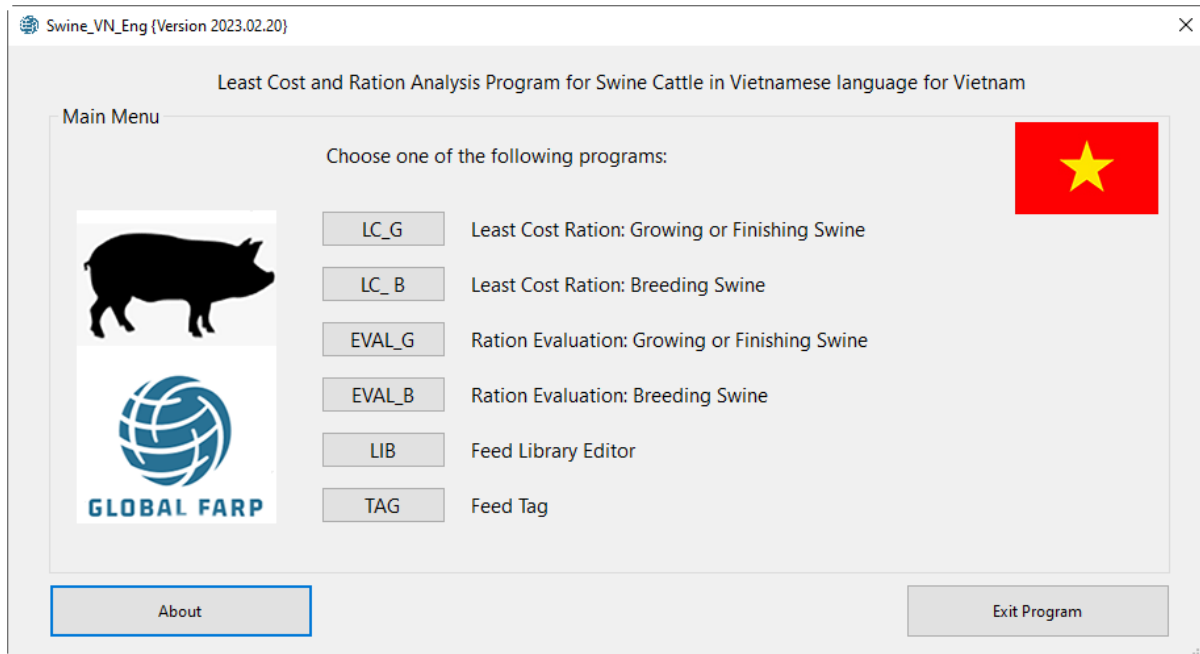




Apollo_VN_Eng



Least Cost and Ration Analysis Program for Swine for Vietnam in English

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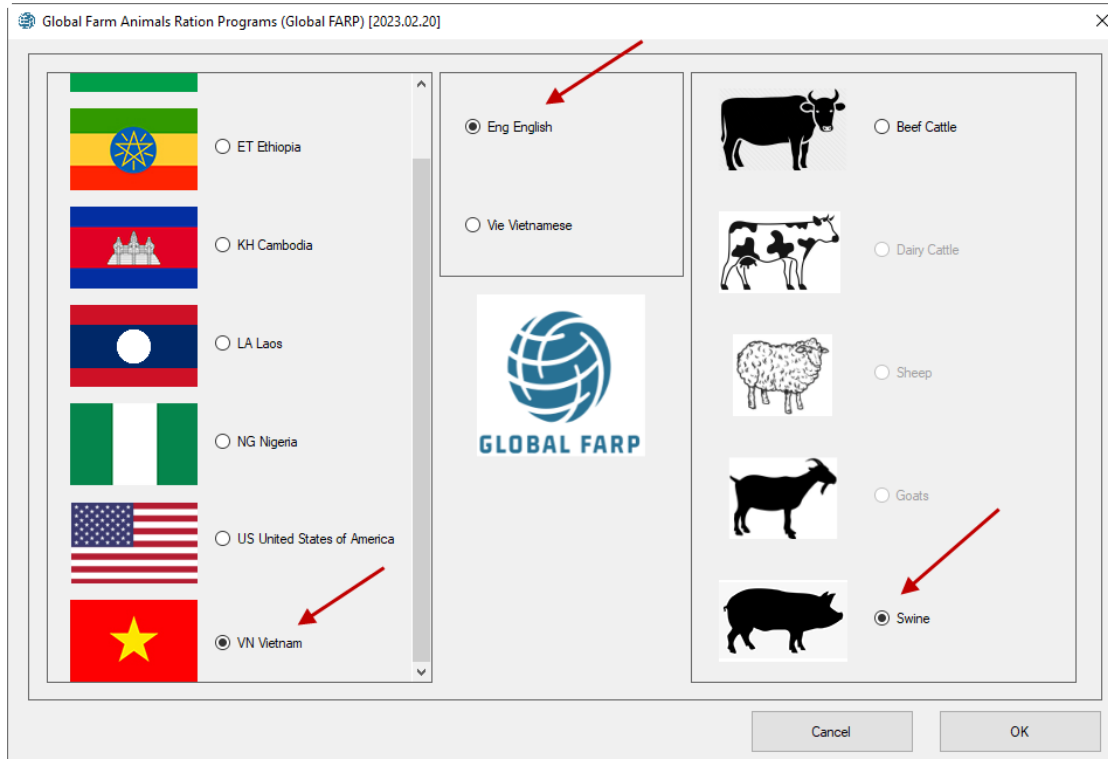
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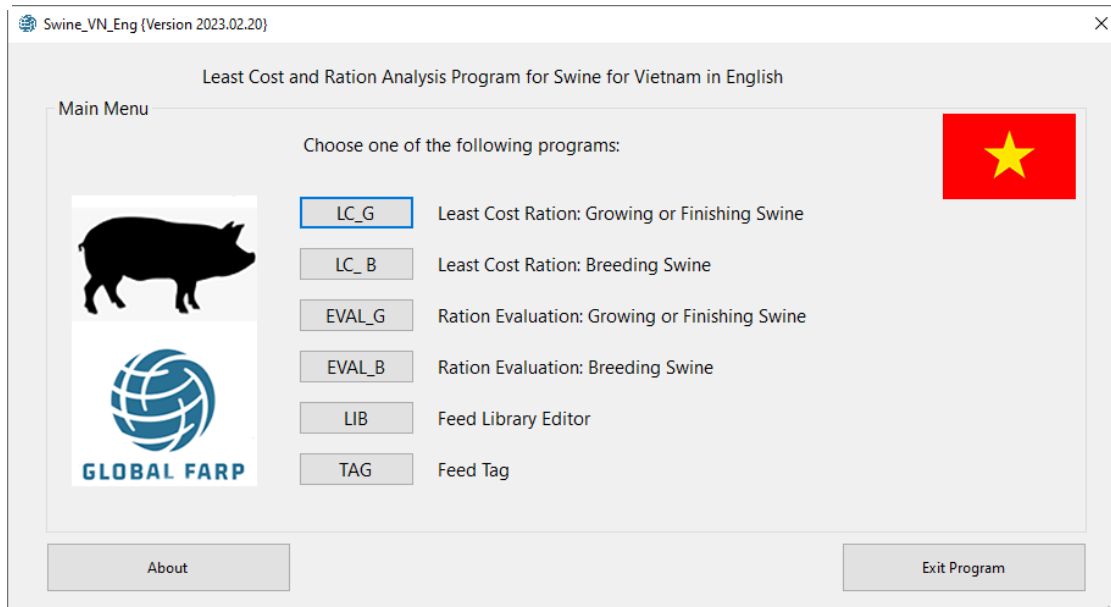
Operation

Opening Menu

Run the GlobalFARP software. The Opening menu appears as shown below:



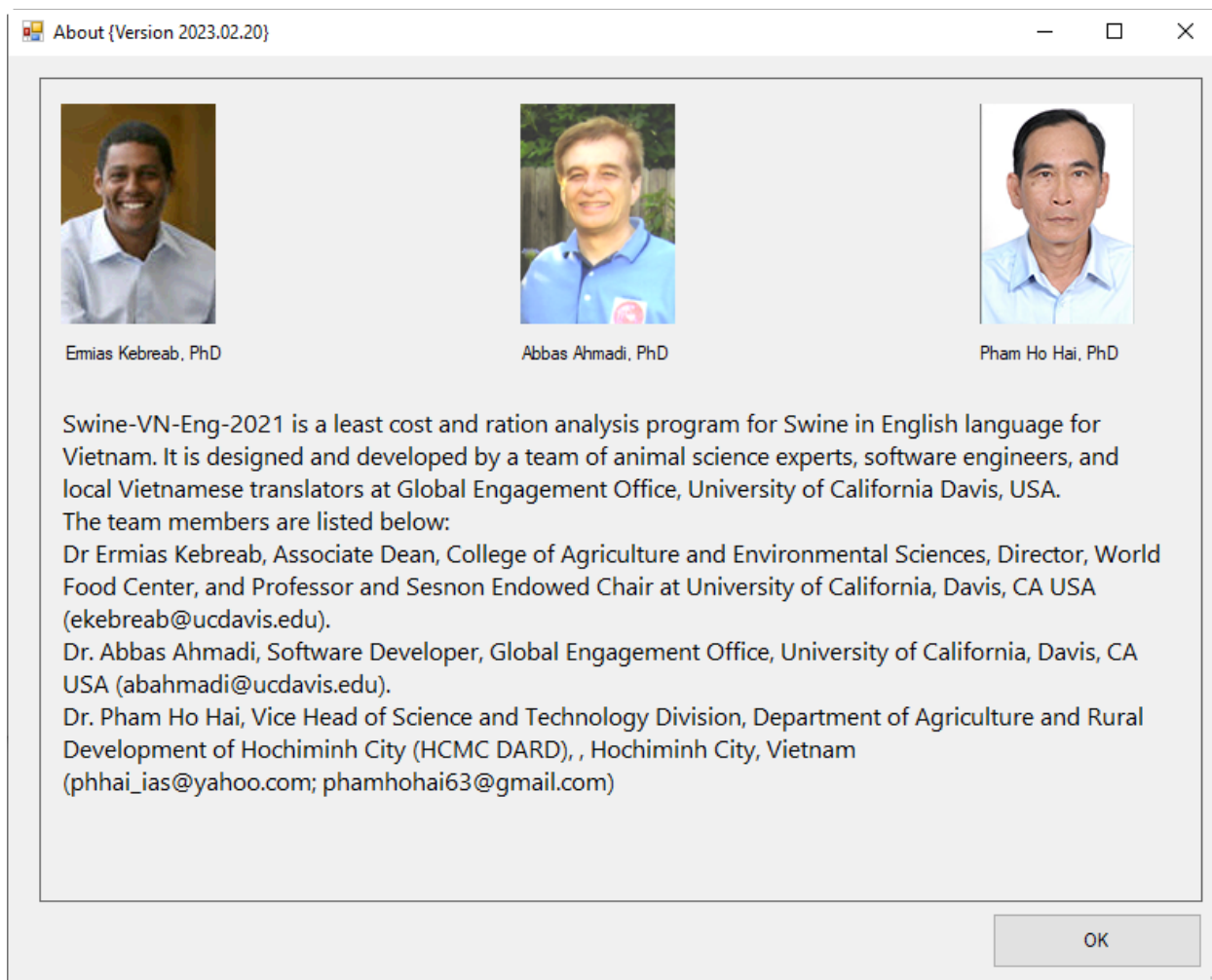
In the countries pane at the left, select the **Vietnam** country. In the farm animals' pane on the right, select the **Swine** species. In the languages pane at center, select **English** language. Click the OK button. The main menu of the Swine software appears, as shown below:



The main menu supports four buttons to evaluate and formulation rations for breeding or growing finishing swine. It also supports two more buttons for the feed library editor and the Feed Tag program.

- Press the LC_G button to formulate a least cost ration for growing or finishing swine.
- Press the LC_B button to formulate a least cost ration for breeding swine.
- Press the EVAL_G button to evaluate an existing ration for growing or finishing swine.
- Press the EVAL_B button to enter the feed library editor and manage feed libraries.
- Press the TAG button to enter the feed tag module and estimate the energy values of local feeds.
- Press the Exit button to exit the program.

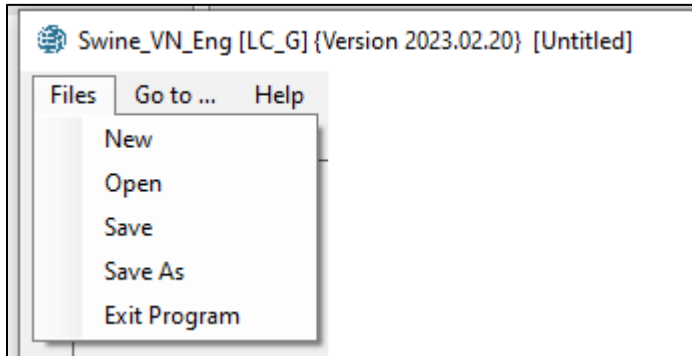
Before exploring the different modules of the software, click the About button to view information about the program and its authors, as shown below:



Navigation Bar

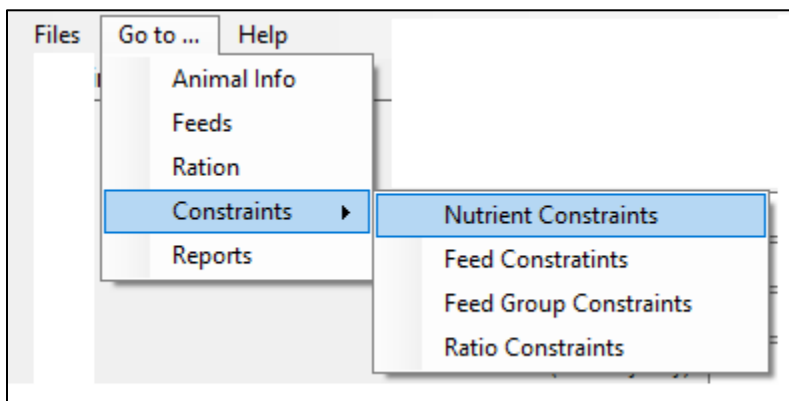
The navigation bar has three main options: Files, Go To, and Help.

Files Menu



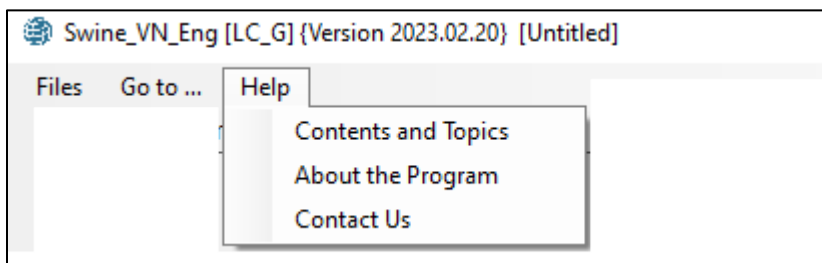
The files menu has five submenus for creating new simulation file, opening an existing simulation file, saving a simulation file, saving a simulation file with different name, and exiting the program.

Go To Menu



The Go To menu has five submenus for going to Animal Info, Feeds, Ration, Constraints, and Reports, The Constraints submenu, in turn, has four more submenu to go to Nutrient Constraints, Feed Constraints, Feed Group Constraints, and Ration Constraints. Note that the Constraints submenu is only available in the formulation module. The evaluation module does not have any constraints submenus.

Help Menu



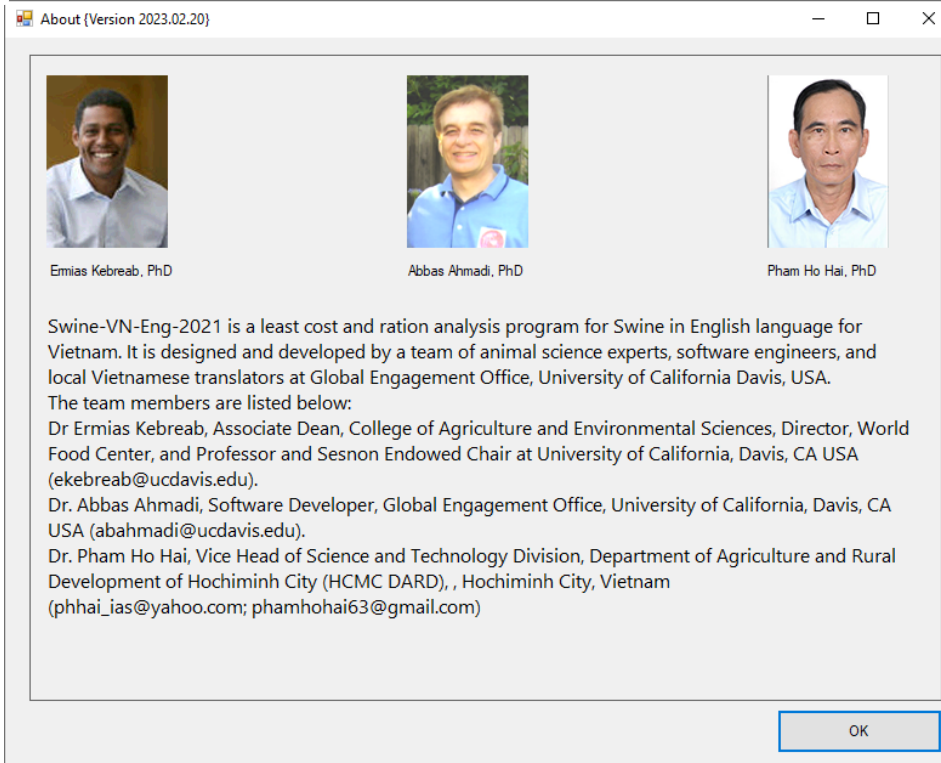
The Help menu has three submenus as listed below:

Contents and Topics



Currently this local web site is empty, but will be populated at the end, after the software is fully developed.

About the Program



This submenu shows the same information as provided by the About button in the Main menu.

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GLOBAL FARP

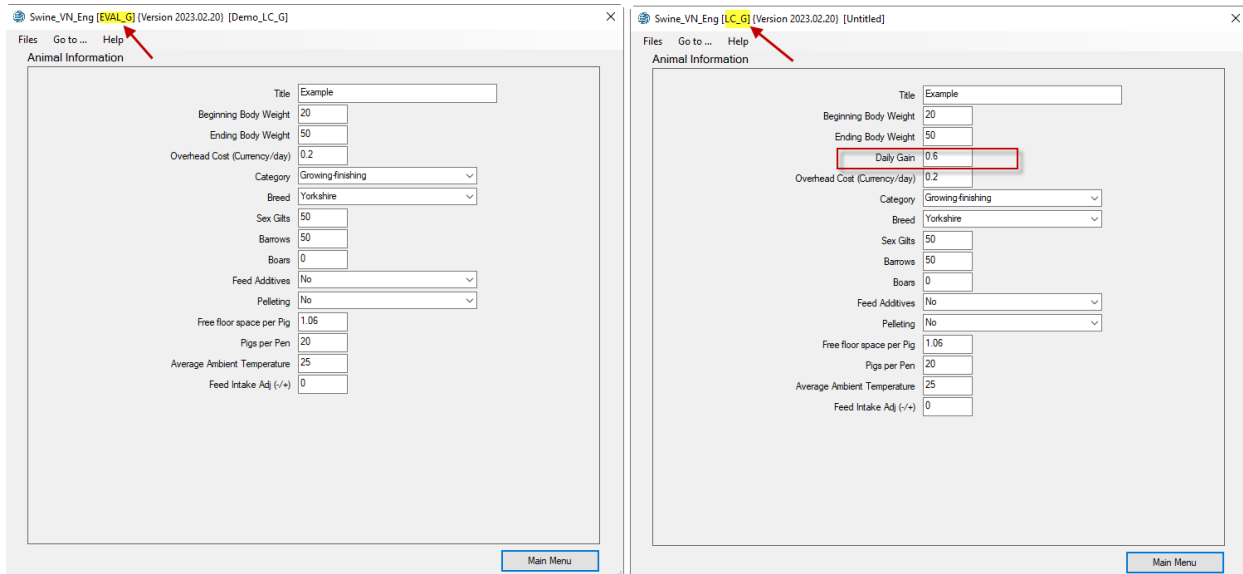
OK

This screen shows the US contact at the top and a scrollable list of our contacts in different countries including Vietnam. Local farmers in Vietnam are encouraged to contact Dr. Pham Ho Hai and he will contact us if needed.

ANIMAL INFORMATION

There are four different animal information screens.

Animal Information Screen for Growing or Finishing Swine



Growing or finishing swine have two animal information screens: one for the evaluation module (EVAL_G) and the other for the formulation module (LC_G). These two screens are the same except for one data entry field, the **daily gain**. The formulation module needs the daily gain field to calculate the nutrient requirements, but the formulation module does not need this data entry field, because it will calculate the daily gain based on the existing ration.

TITLE

Enter a name and/or address or other identification for your ration on this line.

BEGINNING WEIGHT

Live body weight of swine at the beginning of feeding phase. 1 - 110 kg (2 - 240 lb).

ENDING WEIGHT

Expected live body weight of swine at the end of feeding phase. 1 - 130 kg (2 - 285 lb).

DAILY GAIN

This data entry field is available in the formulation module. The average daily gain per animal per day during feeding phase.

Swine Live weight	Expected Weight Gain
1 - 5 kg (2- 11 lb)	0.200 kg (0.44 lb)
5 - 10 kg (11- 22 lb)	0.250 kg (0.55 lb)
10 - 20 kg (22- 44 lb)	0.450 kg (1.00 lb)
20 - 50 kg (44-110 lb)	0.700 kg (1.54 lb)

50 - 110 kg (110-242 lb)	0.820 kg (1.80 lb)
--------------------------	--------------------

DAILY OVERHEAD COST

The nonfeed costs per head per day (dollars). It includes labor, taxes, depreciation, and interest. Usually between \$ 0.01 - 0.50

CATEGORY

The pigs are divided into three categories:

1. Nursing pigs (Suckling pigs)
2. Postweaning pigs (Nursery pigs or Starter pigs)
3. Growing-finishing pigs

The feed intake of nursing, or suckling, pig is dependent upon ability of the sow to produce milk. Access to creep feed is frequently provided during the nursing period to supplement the nutrient intake of the nursing pigs.

BREED

Part of variability associated with feed intake can be attributed to differences in the genetic base or between breeds.

Breed	Digestible Energy Intake
Duroc	2.50%
Hampshire	-2.50%
Yorkshire	-0.75%
Poland china	-0.80%
Spotted poland china	-0.85%
Landrace	-0.10%
Crossbreed	0.00%
Other	0.00%

GILT

Gilts and boars consume less feed than borrows. The difference in feed intake is not observed until their weight reaches 25 kg (55 lb).

BARROW

Gilts and boars consume less feed than borrows. The difference in feed intake is not observed until their weight reaches 25 kg (55 lb).

BOAR

Gilts and boars consume less feed than borrows. The difference in feed intake is not observed until their weight reaches 25 kg (55 lb).

FEED ADDITIVE

Feed additives can influence feed intake. The following table shows the intake adjustment from weaning to market:

Body Weight	Digestible Energy Intake
Below 16 kg (35 lb)	8%
16-56 kg (35-123 lb)	6%
Above 56 kg (123 lb)	2%

PELLETING

Pelleting of feed has resulted in various responses in feed intake of pigs from weaning to market:

Body Weight	Digestible Energy Intake
Below 20 kg (44 lb)	-9.00%
Above 20 kg (44 lb)	-3.10%

FREE FLOOR SPACE

The available free space per pig influences feed intake and performance of pigs from wean to market. If you leave this field as zero, the program ignores this parameter in diet formulation.

Body Weight	Minimum free space needed per pig
Below 20 kg (44 lb)	0.40 sq meter 4.30 sq feet
20-50 kg (44-110 lb)	1.06 sq meter 11.40 sq feet
Above 50 kg (110 lb)	1.09 sq meter 11.72 sq feet

PIGS PER PEN

The number of pigs in a pen influences feed intake and performance of pigs from wean to market. If you leave this field as zero, the program ignores this parameter in diet formulation.

Body Weight	Normal Range
Postweaning	3-15 pigs/pen
Growing-Finishing	5-30 pigs/pen

TEMPERATURE

Temperature affects energy requirement. When the ambient temperature is below the optimum temperature, animals must increase heat production to stay warm. The optimum temperature is calculated by:

$$t_{opt} = 26 - 0.0614 * wt$$

where t_{opt} is optimum temperature in degree centigrade and wt denotes body weight in kg.

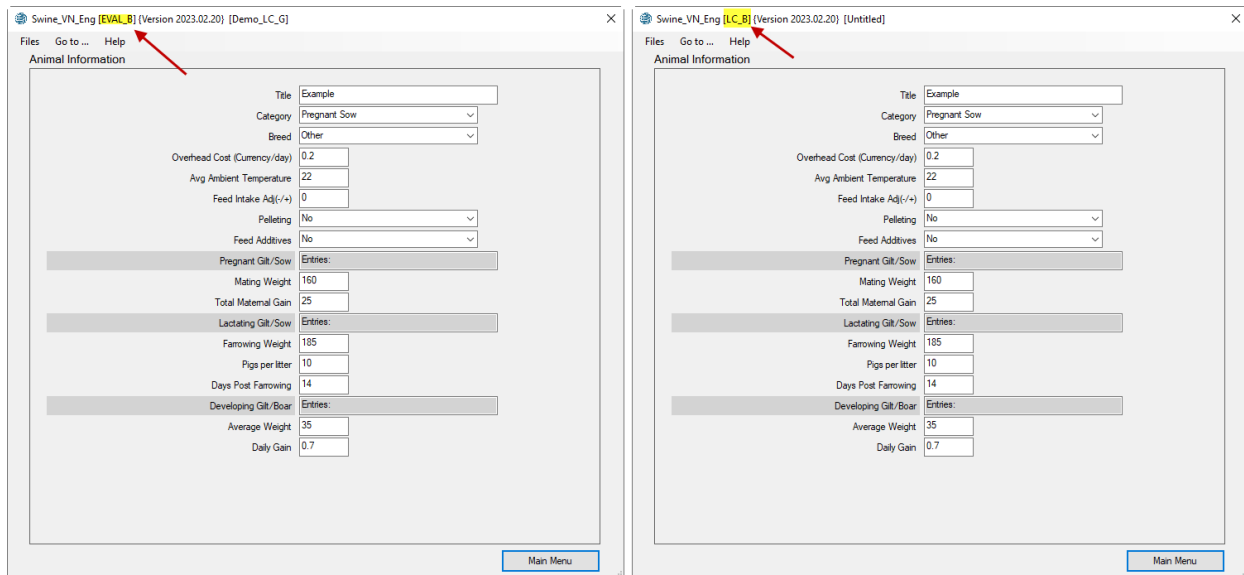
Temperature above the optimum range reduces feed intake. If you leave this field as zero, the program ignores this parameter in diet formulation.

FEED INTAKE ADJUSTMENT

Due to certain feeding situations (ration quality, type of swine, 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.

Animal Information Screen for Breeding Swine



Breeding swine have two animal information screens: one for the evaluation module (EVAL_B) and the other for the formulation module (LC_B). These two screens are the same.

The animal information screen for breeding swine has a set of common data entry fields, which are common between different categories of breeding swine. It also has a set of specific data entry fields, which are specific for each category of breeding swine:

- Pregnant Gilt/Sow
- Lactating Gilt/Sow
- Developing Gilt/Boar

Common data entry fields

There are eight common data entry fields.

Title

Enter a name and/or address or other identification for your ration on this line.

Category

The breeding swine is divided into seven categories:

1. Pregnant Gilt
2. Pregnant Sow
3. Lactating Sow
4. Lactating Gilt
5. Developing Gilt
6. Developing Boar

7. Breeding Adult Boar

The feed intake of swine depends on their category.

Breed

Part of variability associated with feed intake can be attributed to differences in the genetic base or between breeds.

Breed	Digestible Energy Intake
Duroc	2.50%
Hampshire	-2.50%
Yorkshire	-0.75%
Poland china	-0.80%
Spotted poland china	-0.85%
Landrace	-0.10%
Crossbreed	0.00%
Other	0.00%

Daily overhead cost

The nonfeed costs per head per day (dollars). It includes labor, taxes, depreciation, and interest. Usually between \$ 0.01 - 0.50.

Average ambient temperature

When ambient temperature is below the critical temperature, animals must increase heat production to stay warm. For each 1 degree C below the sow's lower critical temperature (18 C = 64.4 F), there is an increase of 4 percent in maintenance cost.

Temperature above the animal's critical temperature will reduce feed intake. For each 1 degree C above the sow's upper critical temperature (20 C = 68 F), there is a reduction of .017 percent in The DE intake.

If you leave this field as zero, the program ignores this parameter in diet formulation.

Feed intake adjustment

Due to certain feeding situations (ration quality, type of swine, etc.), it may be necessary to adjust the total estimated consumption of the ration.

- 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.

Pelleting

Pelleting will reduce the feed intake by 3.1 percent and will decrease the maintenance cost by 10 percent.

Feed additive

Feed additives will reduce the feed intake by 2 percent and will decrease the maintenance cost by 10 percent.

Specific data entry fields

There are three sets of specific data entry fields for different categories of breeding swine:

- Pregnant Gilt/Sow
- Lactating Gilt/Sow
- Developing Gilt/Boar

Pregnant Gilt/Sow	Entries:
Mating Weight	160
Total Maternal Gain	25
Lactating Gilt/Sow	Entries:
Farrowing Weight	185
Pigs per litter	10
Days Post Farrowing	14
Developing Gilt/Boar	Entries:
Average Weight	35
Daily Gain	0.7

Pregnant Gilt/Sow

For pregnant gilts and sows you must specify mating weight and total maternal gain.

Mating weight

Weight of gilt or sow at mating time. Usually from 120 to 160 kg (265 - 353 lb). The default value is 160 kg (352.73)

Total maternal gain

Sows should be fed and manage to gain a net of 25 kg (55 lb) throughout pregnancy. The increase in weight of the placenta and other products of conception should be approximately 20 kg (44 lb), for a total of a 45-kg (99 lb) gestation weight gain of the sow. The gestation length is 114 days.

The program automatically calculates the fetal gain, so enter only the maternal gain 25 kg (55 lb). If you leave this field as zero, the default value will be used.

Lactating Gilt/Sow

For lactating gilts and sows you must specify farrowing weight, pigs per litter, and days post farrowing.

Farrowing weight

Weight of sow at farrowing time. Usually from 145 to 185 kg (320-408 lb). The default value is 185 kg (407.85 lb).

Pigs per litter

The litter size affects the milk yield of lactating sows. If you leave this field as zero, the default value of 10 pigs pre litter will be used.

Pigs/Litter	Milk Yield/Day
4	4.0 kg (8.82 lb)
5	4.8 kg (10.58 lb)
6	5.2 kg (11.46 lb)
7	5.8 kg (12.79 lb)
8	6.6 kg (14.55 lb)
9	7.0 kg (15.43 lb)
10	7.6 kg (16.75 lb)
11	8.2 kg (18.08 lb)
12	8.6 kg (18.96 lb)

Days post farrowing

Days after farrowing for lactating sows. Usually from 1 to 42 days. If you leave this field as zero, the default of 21 days will be used.

Developing Gilt/Boar

For developing gilts and boars you must specify average weight and daily gain.

Average weight

Average live weight of swine during feeding phase: 20 - 150 kg (44 - 330 lb). The default value is 70 kg (154.32 lb).

Daily gain

The average daily gain per animal per day during feeding phase. If you leave it as zero, the default value will be used.

Swine Live weight	Expected Weight Gain
20- 50 kg (44-110 lb)	0.700 kg (1.54 lb)
50-110 kg (110-242 lb)	0.820 kg (1.80 lb)

FEED LIST SCREEN

Library	Feed Name	Season	Feed Number	Region	Feed Price	Feed Price Unit	Internal
0	Barley Pacific Coast		3		120	0	4-07-93
0	Calcium carbonate		11		30	0	6-01-06
0	Calcium phos defluor		14		325	0	6-01-08
0	Corn hominy feed		29		118	0	4-03-01
0	Lysine		49		2600	0	5-00-00
0	Methionine		59		3180	0	5-00-00
0	Premix Vit-Min, University of California Davis		78		1000	0	7-00-00
0	Sodium chloride		87		100	0	6-03-75
0	Sodium phosphate mon		88		750	0	6-04-28
0	Soybean solvent extracted		93		200	0	5-04-60

There is one kind feed list screen for all swine categories and for both evaluation and formulation modules. 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. The amount and price of feeds will be specified in another screen, the Ration screen.

Delete Feed

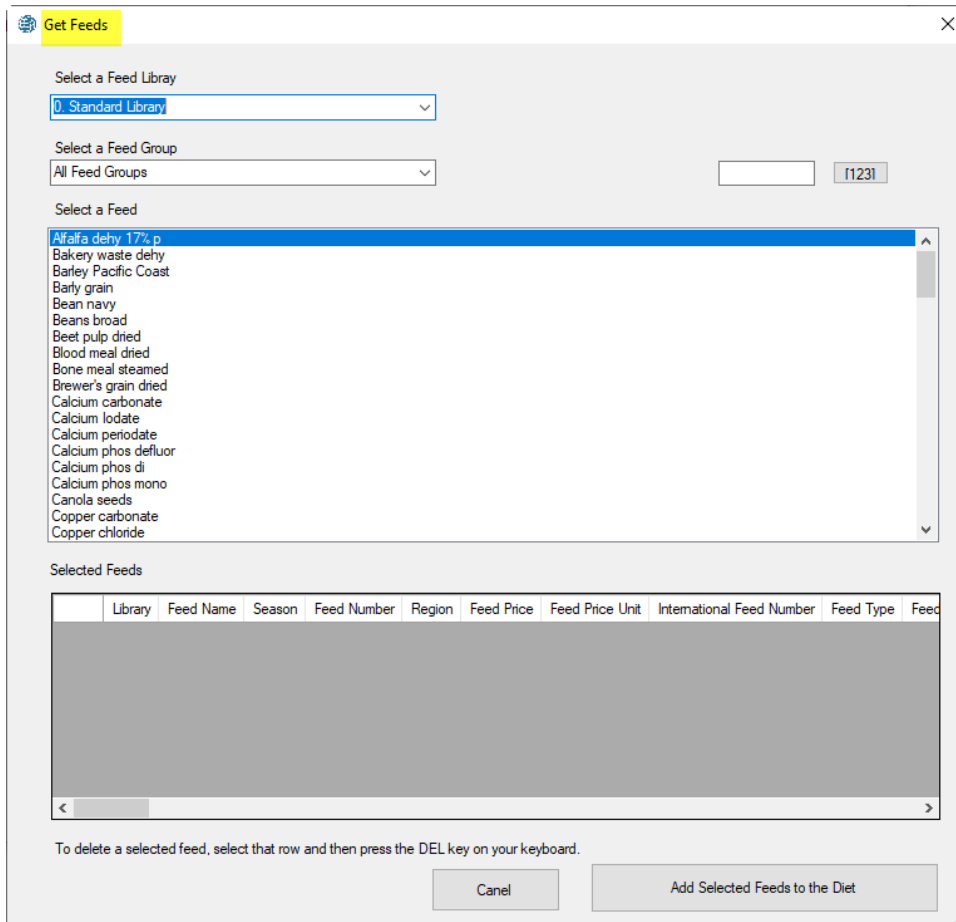
To delete a feed, locate that feed in the feed list and remove the feed by clicking the [Delete] button. To delete all feeds, click the [Delete All] button.

Sort Feeds

To sort feeds alphabetically on the feed names, click the [Sort] button.

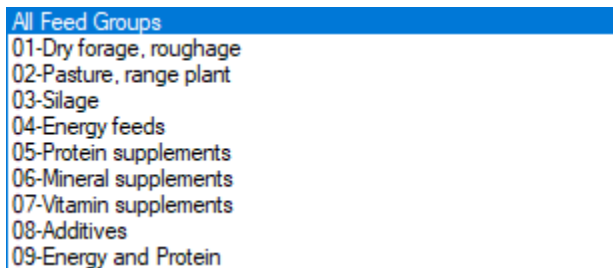
Add Feed

To add a feed to the list, click the Add button. The [Get Feeds] dialog box appears, as shown below:



The first thing you do is to select a feed library. There are two feed libraries: (0) Standard feed library and (1) Alternate feed library. The standard feed library that contains 110 standard feeds. Standard feeds are mostly available in USA. The Alternate feed library that is currently empty but will be populated with local feeds from the target country.

The select a Feed table shows all feeds in the selected library. You can filter them by selecting a feed group. Currently there are nine feed groups as listed below:



Alternatively, you can enter the feed number in the Feed Number slot at the right of the screen and click the [123] button to directly locate that feed in the library.

Once you select a feed you can click on it to add it to the selected feeds table at the bottom of the screen. You can inspect the nutrient contents of the selected feeds. If a feed is selected by mistake, you can delete it from the selected table by simply pressing the Delete key on your keyboard.

You can press the [Add Selected Feeds to the Diet] button to add them to the diet and exit the [Get Feeds] dialog box.

Once a feed is added to your diet, it breaks all its connections to the feed library. Any modification to feeds in the diet do not affect the corresponding feeds in the feed libraries. To modify a feed in the feed library, you must navigate to the main menu and select the Feed Library Editor button. Any modification to feed in the feed libraries do not affect the corresponding feed in the diet.

Edit Feed

To edit a feed in the diet, press the [Edit] button. The [Edit Feed] dialog box appears as shown below:

The screenshot shows the 'Edit Feed' dialog box with the following fields and values:

Field	Value
Library	0. Standard Library
Feed Number	1
International Feed Number	1-00-023
Feed Name	Alfalfa dehy 17% p
Feed Group	02-Pasture, range plant
Feed Type	2. Concentrate
Region	0. All
Season	0. All
Feed Dry Matter (%)	92
Digestible Energy (Mcal/kg)	2.043
Metabolizable Energy (Mcal/kg)	1.853
Crude Protein (% DM)	18.913
Ether Extract (% DM)	3.043
Linoleic Acid (% DM)	0.511
Crude Fiber (% DM)	26.087
Ash (% DM)	30.543
Calcium (% DM)	1.522
Phosphor (% DM)	0.25
Bio Avail Phosphorus (% DM)	0.25

Buttons: Cancel, Save

Library

This is a read only field. We have two kinds of feed libraries: (0) Standard Feed Library; (1) Alternate Feed Library.

Feed number

Each feed in the standard and alternate feed libraries has a unique number assigned to it. We recommend keeping the same number in the diet, but if you want to change it, it must be unique in the diet. Avoid duplicate numbers in the diet.

International feed number

This field is optional. Common feedstuffs 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

Feed name

Each feed in the standard and alternate feed libraries has a unique name assigned to it. We recommend keeping the same name in the diet, but if you want to change it, it must be unique in the diet. Avoid duplicate names in the diet.

Feed group

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. All feeds with an identical group number are considered to be members of the same group. There are nine feed groups, as shown below:

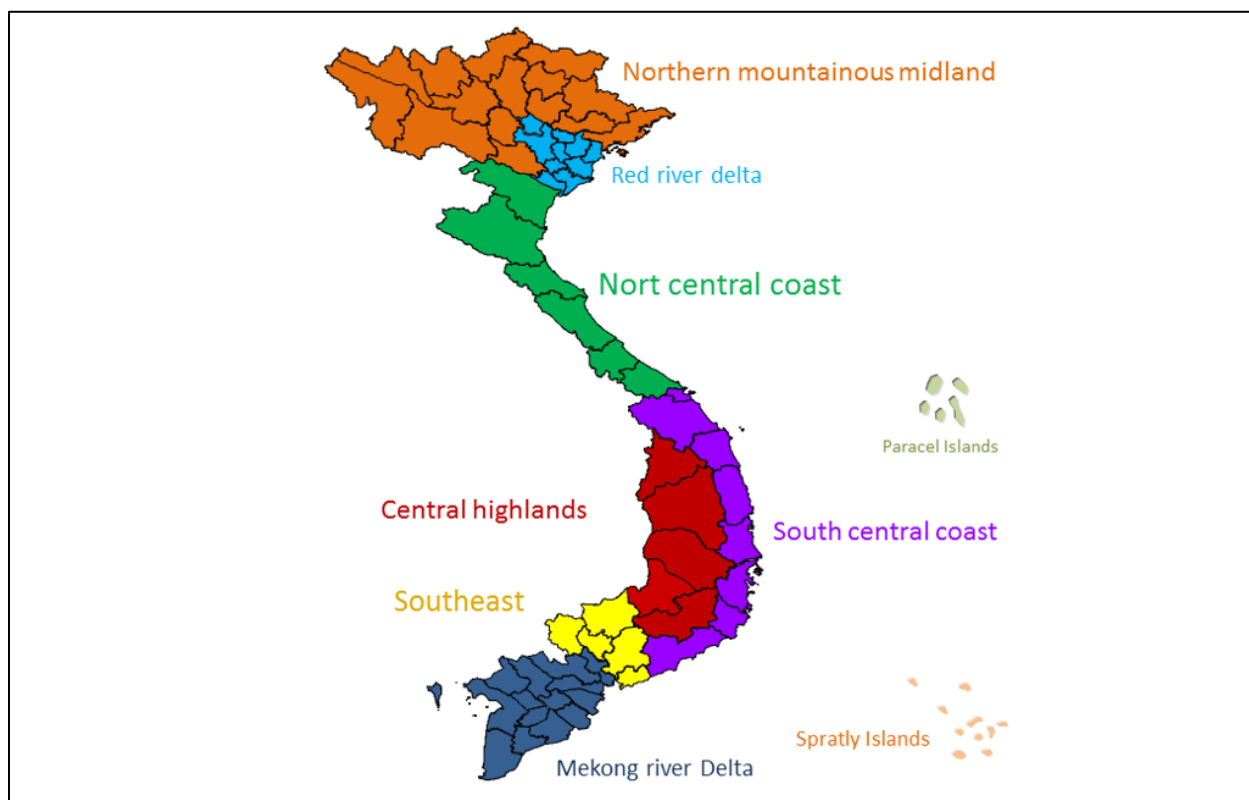
NUMBER	NAME
1	01-Dry forage, roughage
2	02-Pasture, range plant
3	03-Silage
4	04-Energy feeds
5	05-Protein supplements
6	06-Mineral supplements
7	07-Vitamin supplements
8	08-Additives
9	09-Energy and Protein

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.

Region

Specify in what region of country the feed is available. There are seven agro-ecological regions in Vietnam, as shown below:



Region of Vietnam
0. All
1. Northern midland and mountainous
2. Red river delta
3. North Central Coast
4. South Central Coast
5. Central Highlands
6. Southeast
7. Mekong River Delta

Season

Specify in what season of year the feed is available. The typical climate of Vietnam is tropical monsoons. There are four distinct seasons: Spring, Summer, Autumn and Winter in the Northern and North Central regions while there are rainy season and dry season in Southern and South Central regions.

Seasons of Vietnam
0. All
1. Spring

2. Summer
3. Autumn
4. Winter
5. Rainy Season
6. Early Dry Season
7. Dry Season

Feed dry matter

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.

The rest of entry fields are for nutrient analysis. The nutrients are arranged in five groups: (1) Basic nutrients; (2) Major minerals; (3) Minor minerals; (4) Vitamins; and (5) Amino acids.

Basic Nutrients

Basic nutrients are listed below:

DE	Digestible Energy	Mcal/kg
ME	Metabolizable Energy	Mcal/kg
CP	Crude Protein	% DM
EE	Ether Extract	% DM
CF	Crude Fiber	% DM
ASH	Ash	% DM

Major Minerals

Major minerals are listed below:

CA	Calcium	% DM
P	Phosphor	% DM
BAP	Bio Avail Phosphorus	% DM
NA	Sodium	% DM
CL	Chlorine	% DM
MG	Magnesium	% DM
K	Potassium	% DM
S	Sulfur	% DM

Minor Minerals

Minor minerals are listed below:

CO	Cobalt	ppm
CU	Copper	ppm

F	Fluorine	ppm
I	Iodine	ppm
FE	Iron	ppm
MN	Magnesium	ppm
SE	Selenium	ppm
ZN	Zinc	ppm

Vitamins

Vitamins are listed below:

VITA	Vitamin A	k IU/kg
VITD	Vitamin D	k IU/kg
VITK	Vitamin K	k IU/kg
VITE	Vitamin E	mg/kg
BIOT	Biotin	mg/kg
CHOL	Choline	mg/kg
FOLA	Folacin	mg/kg
NIAC	Niacin	mg/kg
PANT	Pantothenic Acid	mg/kg
RIBO	Riboflavin	mg/kg
THIA	Thiamine	mg/kg
B6	Vitamin B6	mg/kg
B12	Vitamin B12	mg/kg

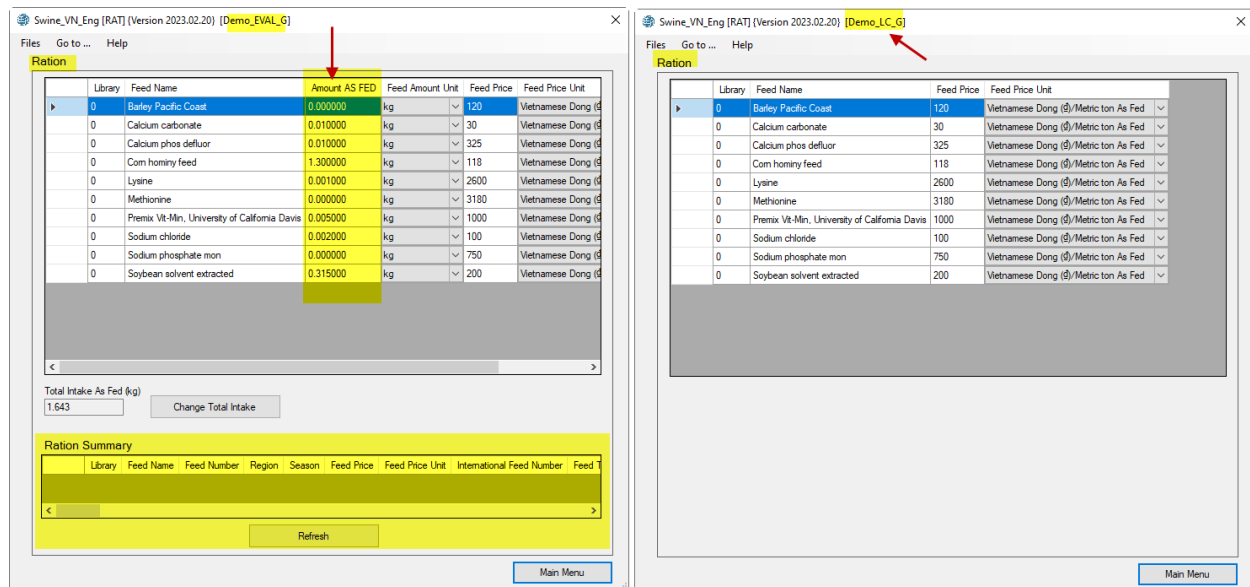
Amino Acids

The 10 essential amino acids for swine are arginine, histidine, isoleucine, leucine, lysine, methionine plus cystine, phenylalanine plus tyrosine, threonine, tryptophan, and valine. The lysine and the remaining essential amino acids are normally provided in sufficient quantities in corn and soybean meal diets.

Amino acids are listed below:

ARGI	Arginine	% DM
HIST	Histidine	% DM
ISOL	Isoleucine	% DM
LEUC	Leucine	% DM
LYSI	Lysine	% DM
MECY	Methionine plus Cystine	% DM
PHTY	Phenylalanine plus Tyrosine	% DM
THRE	Threonine	% DM
TRYP	Tryptophan	% DM
VALI	Valine	% DM

RATION SCREEN



There are two kinds of Ration screens: One for the evaluation module and the other for the formulation module. In the Evaluation module, the user specifies the amounts of feeds in the existing ration and the program evaluates the ration to see if it meets nutrient requirements. In the formulation model the program formulates a new ration and calculates amounts feeds in the new ration, which meets nutrient requirements.

Feed Amount

Enter the feed amount as kg on the “as fed” basis. For the feed amounts, we support up to six decimal places, so the user can enter gram and milligram amounts for trace minerals. If you have the price of feeds on as kg, multiply the price by 1000 to get the price per metric ton.

Feed Price

Enter the feed price as Vietnamese Dong per metric ton on the “as fed” basis.

Total Intake

The evaluation module shows the total intake as kg on the “As Fed” basis. The user can change the total intake by clicking the [Change Total Intake] button. The program automatically adjusts amounts of each feed in the diet to add up to the new feed intake.

You can use this feature to trick the program to enter feed amounts as percentage values. To do this, first enter feed amounts for a 100 kg diet. Then, click the [Change Total Intake] button and change the intake to a more reasonable value such as 1.643 kg. The program automatically adjusts amounts of each feed in the diet to add up to the new feed intake.

Ration Summary

The evaluation module calculates nutrient concentration of the diet and displays it in a scrollable region at the bottom of the screen. Click the [Refresh] button to refresh nutrient concentration in the diet. Currently this feature is not enabled but will eventually be active in future releases of the software.

NUTRIENT CONSTRAINTS

InternalName	DisplayName	Pct_Unit_Metric	Pct_UsrMin	Pct_UsrMax	Amt_Unit_Metric	Amt
DE	Digestible Energy	Mcal/kg	3.191		Mcal	5.708
CP	Crude Protein	% DM	16.670		kg	
CA	Calcium	% DM	0.670		kg	
P	Phosphor	% DM	0.560		kg	
BAP	Bio Avail Phosph...	% DM	0.260		kg	
LYSI	Lysine	% DM	0.830		kg	
THRE	Threonine	% DM	0.530		kg	
TRYP	Tryptophan	% DM	0.130		kg	

Buttons at the bottom: Add, Edit, Delete, Recalculate, Main Menu.

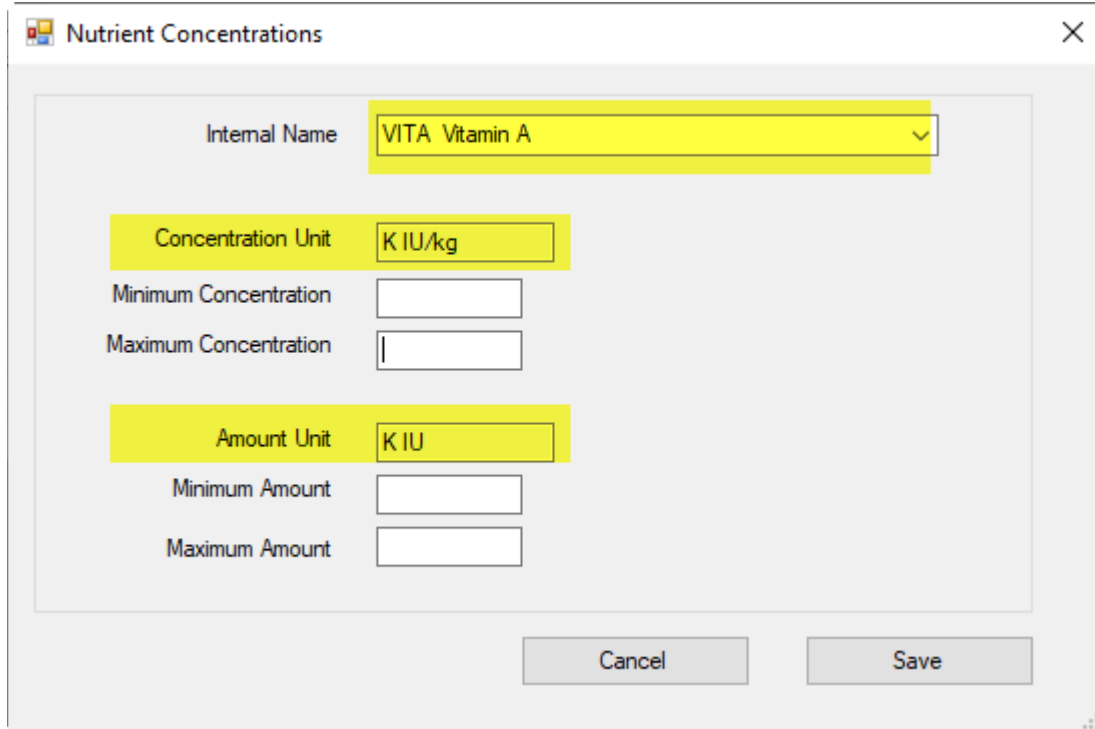
The formulation module has four constraints: (1) Nutrient constraints; (2) Feed constraints; (3) Feed group constraints; and (4) Ration constraints. In this section, we describe the nutrient constraints screen.

Initially this screen is empty. You must click the “Recalculate” button to populate this screen with a set of nutrient requirements for energy (DE), crude protein (CP), minerals (calcium and phosphor), and amino acids (Lysine, Threonine, and Tryptophan). If you modify the animal information screen, you must click the “Recalculate” button to recalculate nutrient requirements.

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

Add

To ADD a constraint, click the Add button. The Nutrients Constraints dialog box appears, as shown below:



The screenshot shows the 'Nutrient Concentrations' dialog box. The 'Internal Name' dropdown is set to 'VITA Vitamin A'. The 'Concentration Unit' dropdown is set to 'K IU/kg'. The 'Amount Unit' dropdown is set to 'K IU'. The 'Minimum Concentration', 'Maximum Concentration', 'Minimum Amount', and 'Maximum Amount' fields are currently empty. The 'Cancel' and 'Save' buttons are visible at the bottom.

Navigate to the [Internal Name] list box and select a nutrient from the drop-down list of all nutrients. For example, select [VITA Vitamin A]. The program automatically populates the units for concentration and amount of the selected nutrients. You can set the minimum and maximum concentrations or amounts.

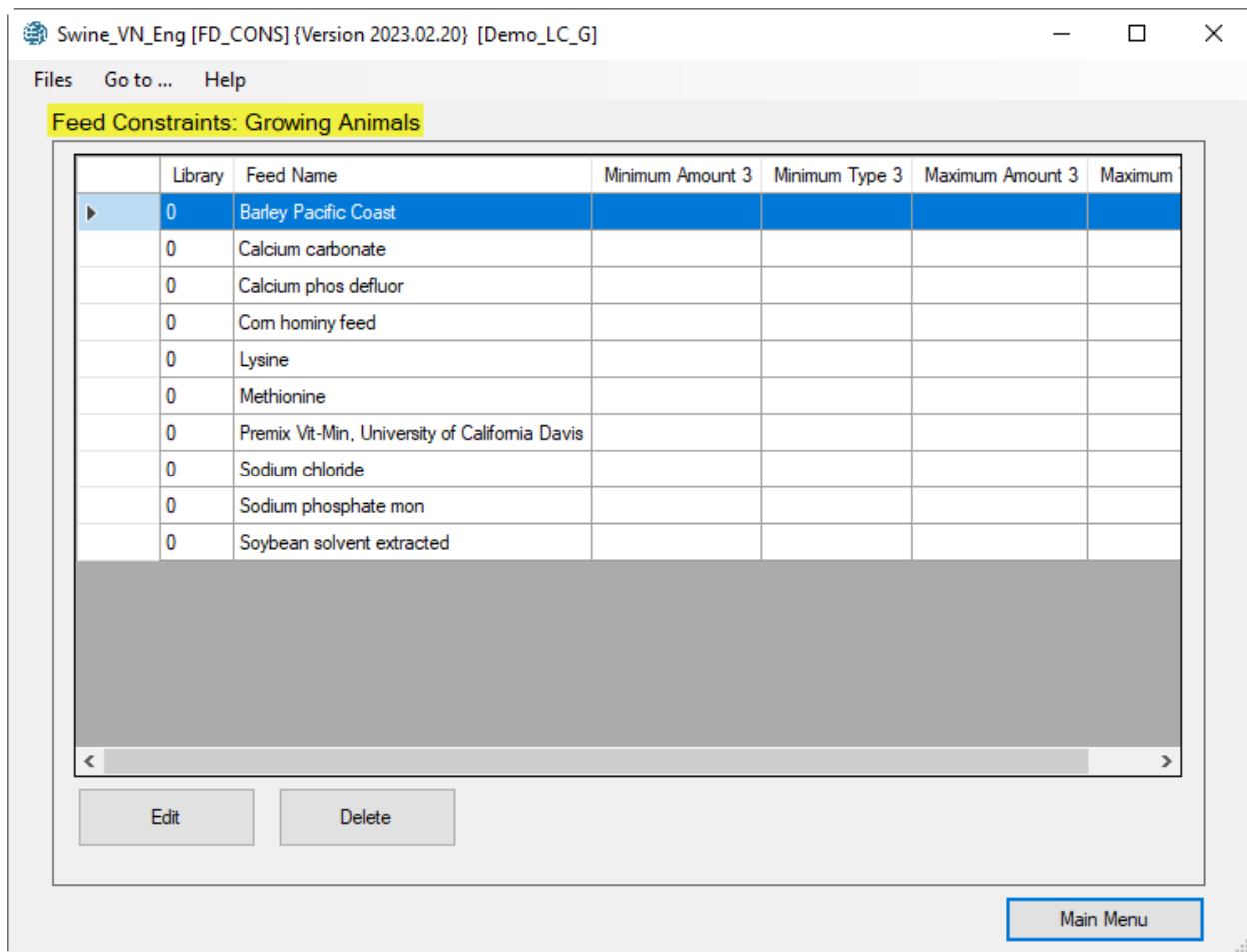
Delete

To delete a constraint, move to the line in the table containing the constraint that you wish to delete. Then click the "Delete" button to remove the constraint.

Edit

First select a nutrient from the list and then click the edit button. The Nutrients Constraints dialog box appears, as shown above, with the difference that the nutrient name is grayed out and cannot be changed but you can change the minimum and maximum concentrations or amounts.

FEED CONSTRAINTS



This screen lists all the feeds that have been specified in the feed list. There are three categories of animals: (1) Lactating gilts and sows; (2) Dry gilts and sows; (3) Growing or finishing animals. Each of these categories has their own feed constraints.

Add

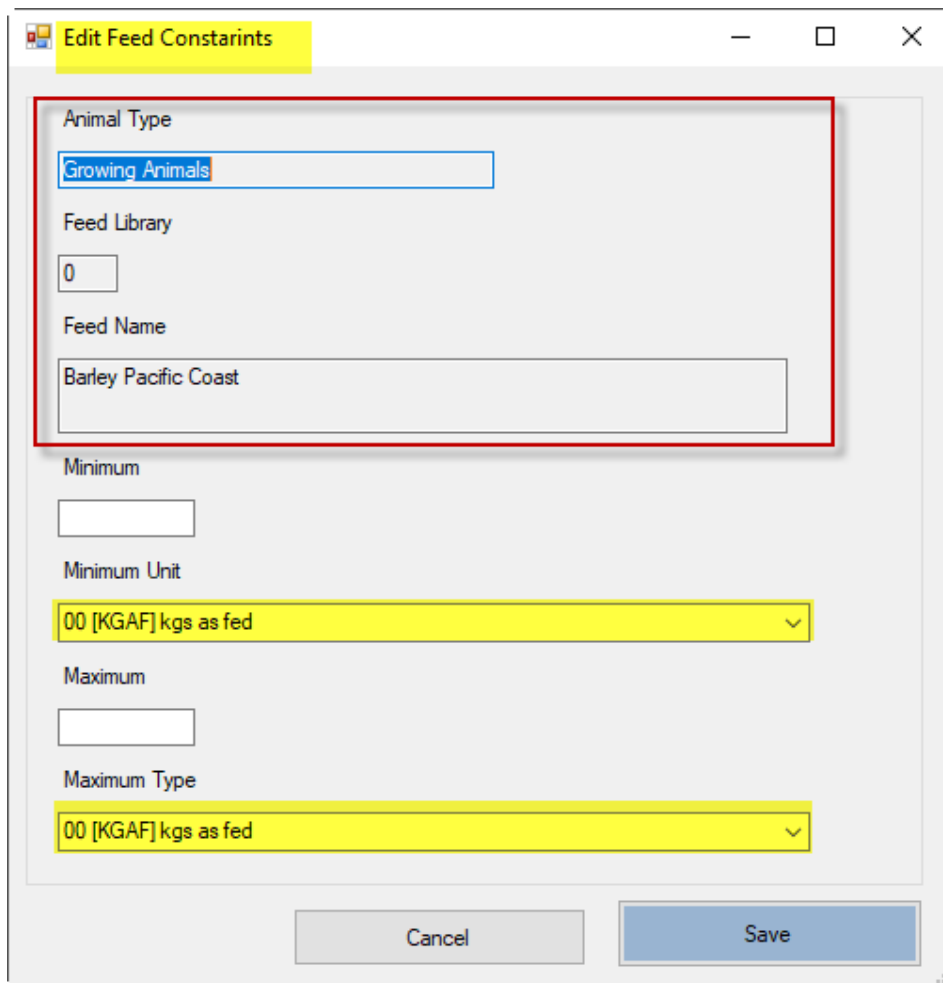
You cannot add a new feed to this screen, but you can edit or delete feed constraints. To add a new feed, you must go to the Feed screen and add a feed in that screen.

Delete

To delete an existing feed constraint, navigate to that constraint and click the “Delete” button. This action clears both the minimum and maximum constraints for the selected feed.

Edit

To edit a feed constraint, navigate to that feed and then click the “Edit” button. The Edit Feed Constraints dialog box appears, as shown below:



The Animal Type, Feed Library, and Feed Name are grayed out and cannot be changed, but you can change the minimum and maximum constraints and their units.

Minimum constraint

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, you must specify a unit for the constraint by selecting one of the eight choices shown below. The commonly used unit is **00 [KGAF] kgs as fed**.

- 00 [KGAF] kgs as fed
- 01 [KGDM] kgs of dry matter
- 02 [%CDM] % of CONCENTRATE portion of ration on 100% DM basis
- 03 [%RDM] % of ROUGHAGE portion of ration on 100% DM basis
- 04 [%TDM] % of TOTAL ration on 100% DM basis
- 05 [%CAF] % of CONCENTRATE portion of ration on AS FED basis
- 06 [%RAF] % of ROUGHAGE portion of ration on AS FED basis
- 07 [%TAF] % of TOTAL ration on AS FED basis

You can set a feed constraint as amount (kg) or as percent (%) of ration based on 100% dry matter or on as fed basis. In case of the percent constraints, you can choose the percent of concentrate portion of ration, or percent of roughage portion of ration, or percent of total ration.

Maximum constraint

You can limit the amount of a specific feed in the ration by entering a maximum constraint on that feed. After you enter the desired amount, you must specify a unit for the constraint by selecting one of the eight choices shown below. The commonly used unit is **00 [KGAF] kgs as fed**.

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

FEED GROUPS CONSTRAINTS

	Group Number	Group Name	Feeds in Group	Minimum Amount 3	Minimum Type 3	Minimum Amount 3	Minimum
▶	-1	Concentrates	10				
	4	04-Energy feeds	2				
	5	05-Protein supplements	3				
	6	06-Mineral supplements	5				
	7	07-Vitamin supplements	1				
	9	09-Energy and Protein	5				

This screen lists all the feed groups that have been specified in the feed list. There are three categories of animals: (1) Lactating gilts and sows; (2) Dry gilts and sows; (3) Growing or finishing animals. Each of these groups have their own feed group constraints.

Add

You cannot add a new feed group to this screen, but you can edit or delete feed group constraints. To add a new feed group, you must go to the Feed screen and add a feed of that group in that screen.

Delete

To delete an existing feed group constraint, navigate to that constraint and click the “Delete” button. This action clears both the minimum and maximum constraints for the selected feed group.

Edit

To edit a feed group constraint, navigate to that feed group and then click the “Edit” button. The Edit Feed Group Constraints dialog box appears, as shown below:

The screenshot shows a dialog box titled "Edit Feed Group Constraints". It contains several input fields and dropdown menus. A red box highlights the "Animal Type" dropdown (set to "Growing Animals"), the "Feed Group Number" text box (containing "4"), and the "Feed Group Name" text box (containing "04-Energy feeds"). Below these are fields for "Minimum" (empty), "Minimum Unit" (dropdown set to "00 [KGAF] kgs as fed"), "Maximum" (empty), and "Maximum Type" (dropdown set to "00 [KGAF] kgs as fed"). At the bottom are "Cancel" and "Save" buttons.

The Animal Type, Feed Group Number, and Feed Group Name are grayed out and cannot be changed, but you can change the minimum and maximum constraints and their units.

Minimum constraint

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, you must specify a unit for the constraint by selecting one of the eight choices shown below. The commonly used unit is **07 [%TAF] % of TOTAL Ration AS FED basis**.

- 00 [KGAF] kgs as fed
- 01 [KGDM] kgs of dry matter
- 02 [%CDM] % of CONCENTRATE portion of ration on 100% DM basis
- 03 [%RDM] % of ROUGHAGE portion of ration on 100% DM basis
- 04 [%TDM] % of TOTAL ration on 100% DM basis
- 05 [%CAF] % of CONCENTRATE portion of ration on AS FED basis
- 06 [%RAF] % of ROUGHAGE portion of ration on AS FED basis

07 [%TAF] % of TOTAL ration on AS FED basis

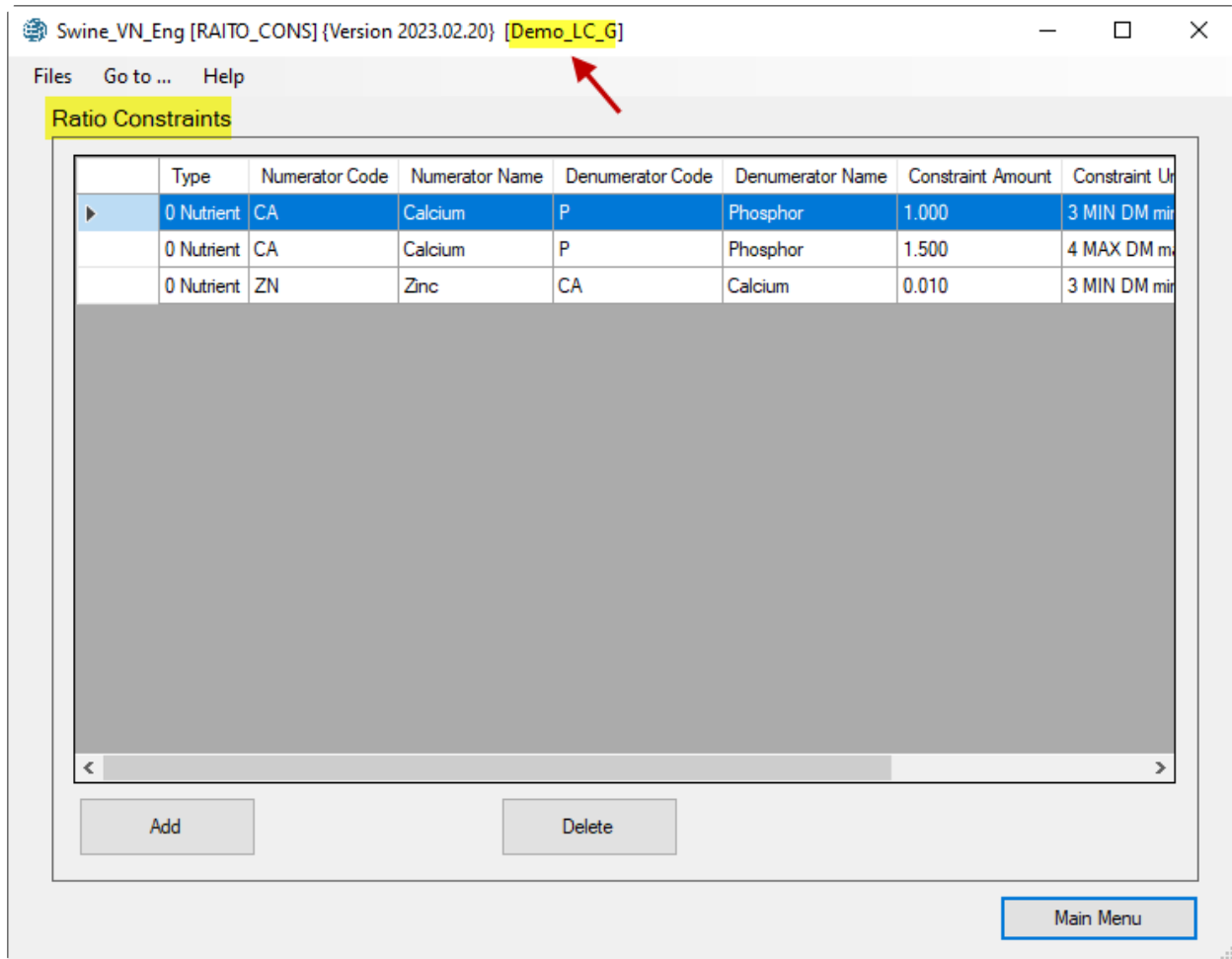
You can set a feed constraint as amount (kg) or as percent (%) of ration based on 100% dry matter or on as fed basis. In case of the percent constraints, you can choose the percent of concentrate portion of ration, or percent of roughage portion of ration, or percent of total ration.

Maximum constraint

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, you must specify a unit for the constraint by selecting one of the eight choices shown below. The commonly used unit is **07 [%TAF] % of TOTAL Ration AS FED basis**.

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

RATIO CONSTRAINTS



In this screen you can define ratio constraints to be used for ration formulation.

Delete

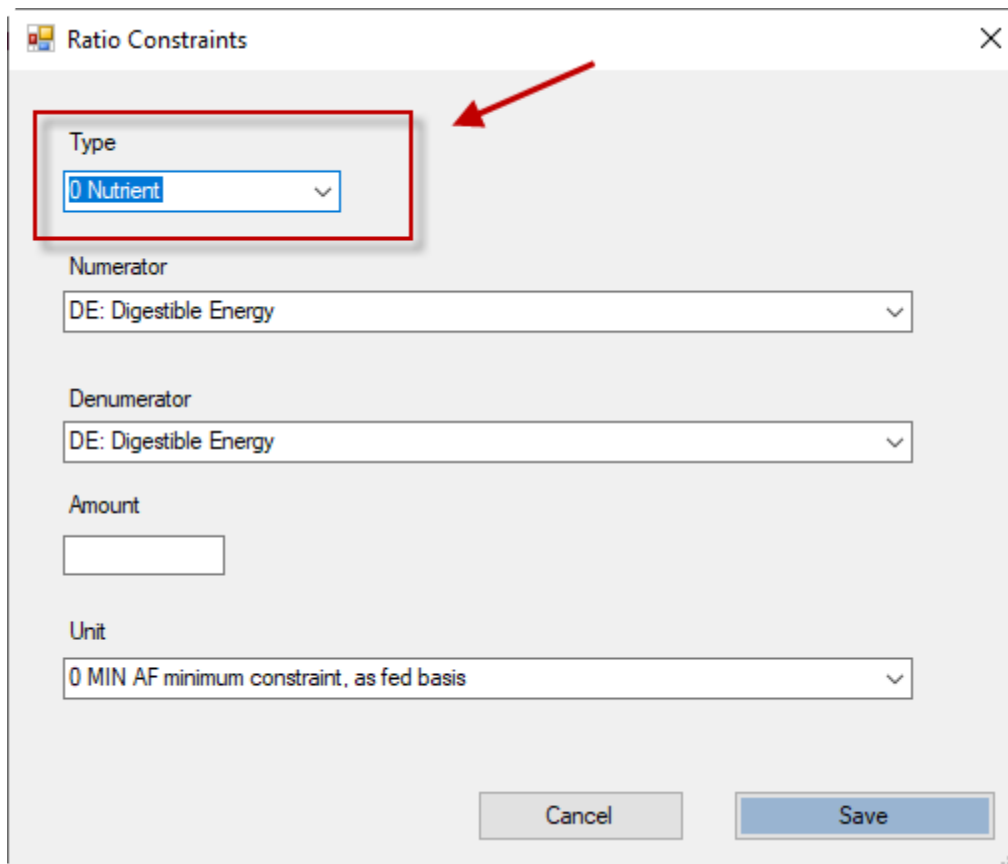
To delete a ratio constraint, navigate to that constraint and click the “Delete” button.

Edit

There is no button to edit a ration constraint. To edit a ratio constraint, you must delete it and then add it with new values.

Add

To add a ratio to the list, click the “Add” button. The “Add Ratio Constraints” dialog box appears, as shown below:



Type

Ratio types are as follows:

- 0 Nutrient ratios
- 1 Feed ratios
- 2 Feed group ratios

Numerator

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. Select a numerator from the drop-down list. For nutrient ratios, this list is populated by a list of nutrients. For feed ratios, this list is populated by a list of feeds in the diet. For feed group ratios, this list is populated by a list of feed groups in the diet.

Denominator

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. Select a denominator from the drop-down list. For nutrient ratios, this list is populated by a list of nutrients. For feed ratios, this list is populated by a list of feeds in the diet. For feed group ratios, this list is populated by a list of feed groups in the diet.

Amount

You should enter a ratio constraint amount as a ratio of numerator to denominator and not as a percentage. For example, if you want to have twice as much calcium as phosphorus in the ration, you will define a calcium to phosphorus ratio of 2.

Unit

Identify the type of ratio constraint by selecting a unit from the drop-down list. The program supports six units as listed below:

- 0 MIN AF minimum constraint, as fed basis.
- 1 MAX AF maximum constraint, on as fed basis.
- 2 EQL AF equality constraint, as fed basis.
- 0 MIN DM minimum constraint, dry matter basis.
- 1 MAX DM maximum constraint, dry matter basis.
- 2 EQL DM equality constraint, dry matter basis.

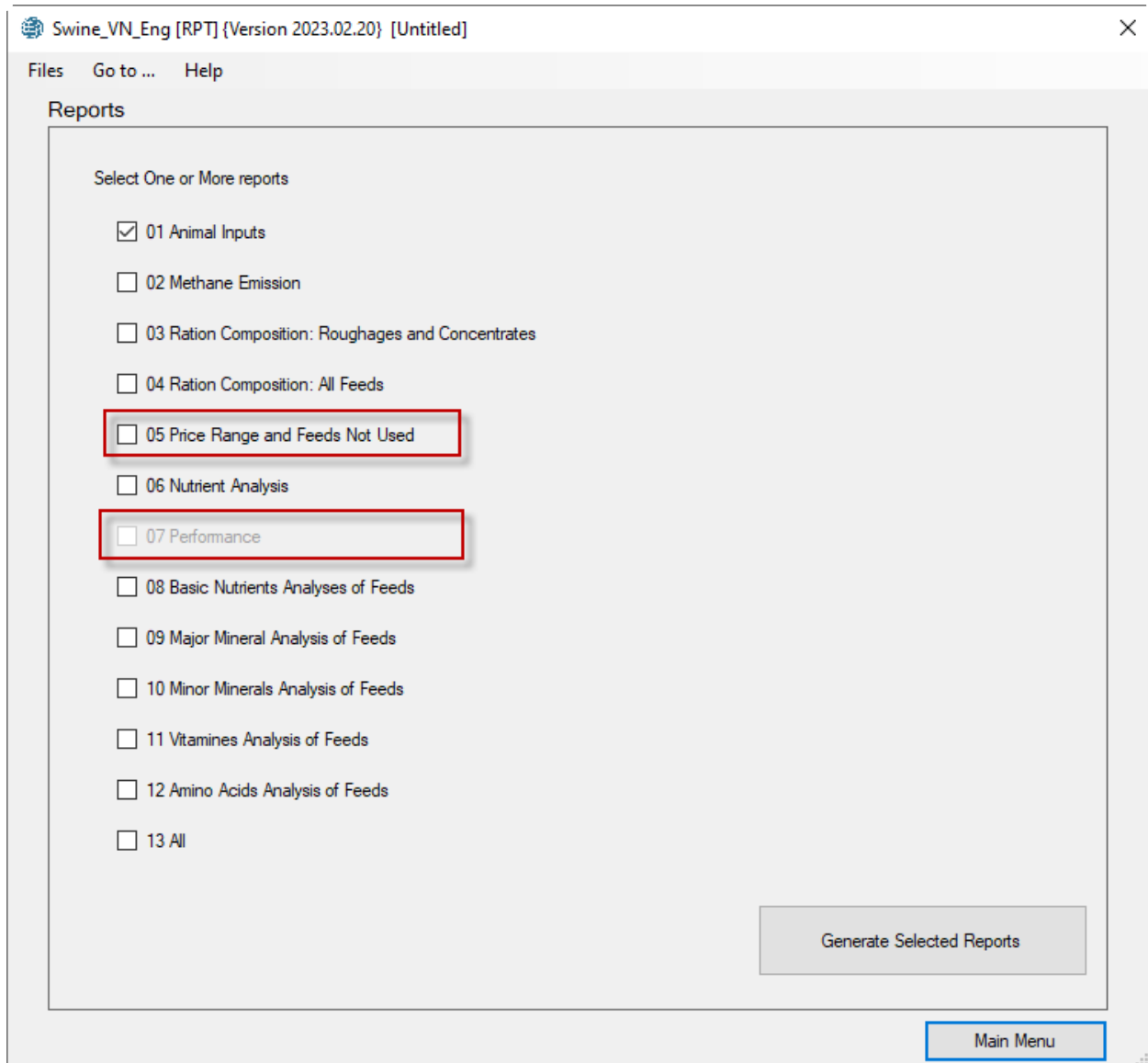
A minimum ratio constraint forces the ration to contain at least the minimum ratio or may be more.

A maximum ratio constraint forces the ration to contain at most the maximum ratio or may be less.

An equality ratio constraint forces the ration to contain exactly the specified ratio and nothing more nor nothing less.

The minimum, maximum, and equality ratio constraints can be on 100% dry matter basis or on as fed basis.

Reports



The software support 12 reports. Report 05 “Price Rane and Feeds Not Used” is only available in the formulation module. Report 07 “Performance: is only available in the evaluation module. The format of Report 06 “Nutrient analysis” is different in evaluation module than the formulation module. The columns for user constraints are available in Repot Of for formulation module. Because only in formulation module the user can specify constraints.

Report 01. Animal Inputs

This report lists input entries for the animal information screen.

Item	Value
Title	Example
Beginning Body Weight	20
Ending Body Weight	50
Daily Gain	0.6
Overhead Cost (Currency/day)	0.2
Category	Growing-finishing
Breed	Yorkshire
Sex Gilts	50
Barrows	50
Boars	0
Feed Additives	No
Pelleting	No
Free floor space per Pig	1.06
Pigs per Pen	20
Average Ambient Temperature	25
Feed Intake Adj (-/+)	0

Report 02. Methane Emissions

This report displays information about Methane emission. The most important index is the Methane Conversion Rate (%), which ranges from 2 to 20 percent.

Item	Value
Methane Emission in MJ per day per head (MJ/d)	0.229
Methane Emission in Mcal per day per head (Mcal/d)	0.055
Methane Emission in gram per day per head (g/day)	4.122
Methane Emission in gram per kg of dry matter intake (g/kg)	2.739
Methane Conversion Rate (%)	3.334

(1) The methane conversion rate is the fraction of gross energy in diet converted to methane (percent). Normal Range 2 to 12:

- 3.5 Extremely Low
- 4.5 Very Low
- 5.5 Low
- 6.5 Average
- 7.5 High
- 8.5 Very High
- 9.5 Extremely High

Global warming potential (GWP) is the heat absorbed by any greenhouse gas in the atmosphere, as a multiple of the heat that would be absorbed by the same mass of carbon dioxide (CO₂). GWP is 1 for CO₂. For other gases it depends on the gas and the time frame. Carbon dioxide equivalent (CO₂e or CO₂eq or CO₂-e) is calculated from GWP. For any gas, it is the mass of CO₂ that would warm the earth as much as the mass of that gas. Thus, it provides a common scale for measuring the climate effects of different gases. It is calculated as GWP times mass of the other gas. Methane has GWP (over 100 years) of 34 meaning that, for example, a leak of a ton of methane is equivalent to emitting 34 tons of carbon

dioxide. Similarly, a tonne of nitrous oxide, from manure for example, is equivalent to 273 tonnes of carbon dioxide. The most recent Intergovernmental Panel on Climate Change (IPCC) report values for methane's 20-year GWP at 86 and 100-year GWP at 34.

Report 03. Ration Composition (Important nutrients)

This report lists the amounts of important nutrients such as energy (DE, ME), crude protein (CP), minerals (CA, P), and amino acids (LYSI, THRE, TRYP) for each feed. The list is generated separately for roughages, or concentrates, or total ration. The last row of each report shows the total amount of nutrients in the diet. In this example, we have 5.708 Mcal of Digestible Energy (DE), 251 grams of crude protein, 10 grams of Calcium, 9 grams of phosphorus, 12 grams of Lysine (LYSI), 10 grams of Threonine (THRE) and 3 grams of Tryptophan (TRYP).

Report 03. Ration Composition: Roughages and concentrates												
Report 03-1. Roughages												
Library	Feed Name	AMT_AF kg	AMT_DM kg	DE Mcal	ME Mcal	CP kg	CA kg	P kg	BAP kg	LYSI kg	THRE kg	TRYP kg
Report 03-2. Concentrates												
Library	Feed Name	AMT_AF kg	AMT_DM kg	DE Mcal	ME Mcal	CP kg	CA kg	P kg	BAP kg	LYSI kg	THRE kg	TRYP kg
0	Barley Pacific Coast	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Calcium carbonate	0.021641	0.021641	0.000	0.000	0.000	0.008	0.000	0.003	0.000	0.000	0.000
0	Calcium phos defluor	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Corn hominy feed	1.401043	1.260939	4.896	4.638	0.149	0.001	0.007	0.001	0.005	0.006	0.002
0	Lysine	0.000720	0.000720	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
0	Methionine	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Premix Vit-Min, University of California Davis	0.004171	0.004171	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Sodium chloride	0.008342	0.008342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Sodium phosphate mon	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Soybean solvent extracted	0.232548	0.209293	0.812	0.749	0.102	0.001	0.002	0.001	0.007	0.004	0.001
		1.668	1.505	5.708	5.387	0.251	0.010	0.009	0.005	0.012	0.010	0.003
Report 03-3. Total Ration												
Library	Feed Name	AMT_AF kg	AMT_DM kg	DE Mcal	ME Mcal	CP kg	CA kg	P kg	BAP kg	LYSI kg	THRE kg	TRYP kg
0	Barley Pacific Coast	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Calcium carbonate	0.021641	0.021641	0.000	0.000	0.000	0.008	0.000	0.003	0.000	0.000	0.000
0	Calcium phos defluor	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Corn hominy feed	1.401043	1.260939	4.896	4.638	0.149	0.001	0.007	0.001	0.005	0.006	0.002
0	Lysine	0.000720	0.000720	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
0	Methionine	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Premix Vit-Min, University of California Davis	0.004171	0.004171	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Sodium chloride	0.008342	0.008342	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Sodium phosphate mon	0.000000	0.000000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	Soybean solvent extracted	0.232548	0.209293	0.812	0.749	0.102	0.001	0.002	0.001	0.007	0.004	0.001
		1.668	1.505	5.708	5.387	0.251	0.010	0.009	0.005	0.012	0.010	0.003

Report 04. Ration Composition

This report displays the amounts of all feeds used in the ration. The following information is included for each feed used in the ration:

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.

In this example, The ration is mostly consisting of 84% of corn and 14% of Soybean for a total of 98% on “as fed” basis. The remaining feeds accounts for only 2% of the ration. The intake is 1.51 kg on “100% dry matter” basis or 1.67 kg on “as fed” basis. The ration price is 131.47 local currency per metric ton on “as fed” basis, or 145.74 local currency per metric ton on “100% dry matter” basis. The ration cost is about 0.22 local currency per head per day.

Report 04. Ration Composition: All Feeds								
Library	Feed Name	Intake DM kg	Intake DM %	Intake AF kg	Intake AF %	Price ₪/Metric ton As Fed	Price ₪/Metric ton Dry Matter	Price ₪/day
0	Barley Pacific Coast	0.000000	0.000000	0.000000	0.000000	120.00	134.83	0.00
0	Calcium carbonate	0.021641	1.437839	0.021641	1.297060	30.00	30.00	0.00
0	Calcium phos defluor	0.000000	0.000000	0.000000	0.000000	325.00	325.00	0.00
0	Corn hominy feed	1.260939	83.777407	1.401043	83.971974	118.00	131.11	0.17
0	Lysine	0.000720	0.047837	0.000720	0.043153	2600.00	2600.00	0.00
0	Methionine	0.000000	0.000000	0.000000	0.000000	3180.00	3180.00	0.00
0	Premix Vit-Min, University of California Davis	0.004171	0.277123	0.004171	0.249990	1000.00	1000.00	0.00
0	Sodium chloride	0.008342	0.554247	0.008342	0.499981	100.00	100.00	0.00
0	Sodium phosphate mon	0.000000	0.000000	0.000000	0.000000	750.00	750.00	0.00
0	Soybean solvent extracted	0.209293	13.905546	0.232548	13.937841	200.00	222.22	0.05
		1.51	100.00	1.67	100.00	131.47	145.74	0.22

Report 05. Price Range

This report 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.

Report 05_2 displays the following information for feeds not used in the ration:

1. The current price of feed on an as fed basis.
2. The opportunity price of the feed. This is the price that the feed must drop to, 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.

Report 05. Price Range and Feeds Not Used**Report 05_1. Feeds used in ration**

Lib	Name	Amount Kg as Fed	Price at Formulation đ/Metric ton As Fed	Lower Range Price đ/Metric ton As Fed	Upper Range Price đ/Metric ton As Fed
0	Calcium carbonate	0.021641	30.00	-32.50	612.49
0	Corn hominy feed	1.401043	118.00	-38.57	131.77
0	Lysine	0.000720	2600.00	-45.40	3124.88
0	Premix Vit-Min, University of California Davis	0.004171	1000.00	-17.92	172863.80
0	Sodium chloride	0.008342	100.00	-32.71	86031.90
0	Soybean solvent extracted	0.232548	200.00	186.25	27170.87

Report 05_2. Feeds not used in ration

Lib	Name	Price at formulation đ/Metric ton As Fed	Oppurtunity price đ/Metric ton As Fed
0	Barley Pacific Coast	120.00	99.74
0	Calcium phos defluor	325.00	2.14
0	Methionine	3180.00	-33.39
0	Sodium phosphate mon	750.00	-33.39

Report 06. Nutrient Analysis of Ration

This report displays nutrient analysis for all feeds in the ration. 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.
- 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, you can determine if the ration is deficient in that particular nutrient.

In the formulation module, you will also see the following:

- 3. Minimum and maximum constraints.** These are the constraints which were used by the program when the ration was formulated.

Report 06. Nutrient Analysis on 100% Dry Matter Basis

Nutrient	Display Name	Amount	Unit	User Minimum	User Maximum	NRC Minimum	NRC Maximum
DM	Feed Dry Matter	90.209	% DM				
		1.505	kg				
DE	Digestible Energy	3.792	Mcal/kg	3.191		3.191	
		5.708	Mcal	*	5.708	5.708	
ME	Metabolizable Energy	3.579	Mcal/kg				
		5.387	Mcal				
CP	Crude Protein	16.670	% DM	16.670		16.670	
		0.251	kg				
EE	Ether Extract	5.476	% DM				
		0.082	kg				
LINO	Linoleic Acid	3.115	% DM			0.110	
		0.047	kg				
CF	Crude Fiber	5.784	% DM				
		0.087	kg				
ASH	Ash	3.590	% DM				
		0.054	kg				
CA	Calcium	0.670	% DM	0.670		0.670	
		0.010	kg				
P	Phosphor	0.585	% DM	0.560		0.560	
		0.009	kg				

Report 07 displays the performance information.

Report 08 lists basic nutrient analysis of feeds.

Report 09 lists major minerals analysis of feeds

Report 10 lists minor minerals analysis of feeds.

Report 11 lists vitamins analysis of feeds.

Report 12 lists Amino Acids Analysis of Feeds.

FEED TAG

Feed Name	<input type="text"/>
Feed Group	Dry forage and roughage legumes
Dry Matter of Feed (DM) (%)	90
Crude Protein (CP) (% AF)	20
NPN Protein Equivalent (% AF)	0
Fat or Oil (EE) (% AF)	2.7
Ash (% AF)	9.8
Crude Fiber (CF) (% AF)	23
Energy values on 100% DM Basis	
Digestible Energy (DE) (Mcal/kg)	2.74
Metabolizable Energy (ME) (Mcal/kg)	2.25
Net Energy for Maintenance (NEM) (Mcal/kg)	1.38
Net Energy for Gain (NEG) (Mcal/kg)	0.94
Net Energy for Lactation (NEL) (Mcal/kg)	1.4
Total Digestible Nutrients (TDN) (% DM)	62.23

This module calculates the energy values of a feed using the basic nutrient analysis of feeds, which consists of crude protein (CP), non-protein nitrogen protein equivalent, fat or oil or ether extract (EE), ash, and crude fiber (CF). For air-dried feeds the dry matter of feed is usually about 90%.

The input entries are on “as fed” basis, but the output values are on 100% dry matter basis. The program provides a “Default” button to populate the input entries with default values. We recommend that you use this button and then modify the input entries.

Feed Name

Assign a name for feed. Example, ALFALFA. The feed name is not used in energy calculation. It is just for identification.

Feed Group

Select a group for feed. Example, Dry forage and roughage: Legumes. The feed group is used for energy calculations. The program support seven feed groups as listed below:

1. General
2. Dry forage and roughage, legumes
3. Dry forage and roughage, non-legumes
4. Pasture and range plant

5. Silage
6. Energy feeds
7. Protein Supplements feeds

If you do not know the feed group, select the General option.

Dry Matter of Feed

Enter a value between 1 to 100%. Example: 90.00%

Crude Protein (CP)

Enter a value between 0 to 100%. Example: 90.00%

NPN Protein Equivalent

Enter a value between 0 to 100%. Example: 0.00%

Fat or Oil (EE)

Enter a value between 0 to 100%. Example: 2.70%

Ash

Enter a value between 0 to 100%. Example: 9.80%

Crude Fiber (CF)

Enter a value between 0 to 100%. Example: 23.00%

After entering input values, click the Calculate button, 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:

General:

$$DE= 3.916828 - 0.00812 *CP+0.04554 * EE-0.0176 * ash-0.0422 * CF$$

Dry forage and roughage, legumes:

$$DE= 2.811904 + 0.0209413*CP + 0.006492 *EE + 0.01302*ash - 0.0274 *CF$$

Dry forage and roughage, non-legumes:

$$DE= 3.264743 + 0.06363 *CP - 0.0761 * EE - 0.0508 *ash -0 .0283 *CF$$

Pasture and range plant:

$$DE= 3.723255 + 0.002459 *CP + 0.0815818*EE - 0.0211 *ash - 0.036135 *CF$$

Silage

$$DE= 3.681242 - 0.0130 *CP + 0.04553 *EE - 0.0328 *ash - 0.0284 *CF$$

Energy feeds

$$DE = 3.729697 + 0.008047 * CP + 0.04582 * EE - 0.0393 * ash - 0.0392 * CF$$

Protein Supplements feeds

$$DE = 4.706482 - 0.0158 * CP + 0.034633 * EE - 0.0241 * ash - 0.0598 * CF$$

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, %:

$$TDN = 100 * (DE / 4.4)$$

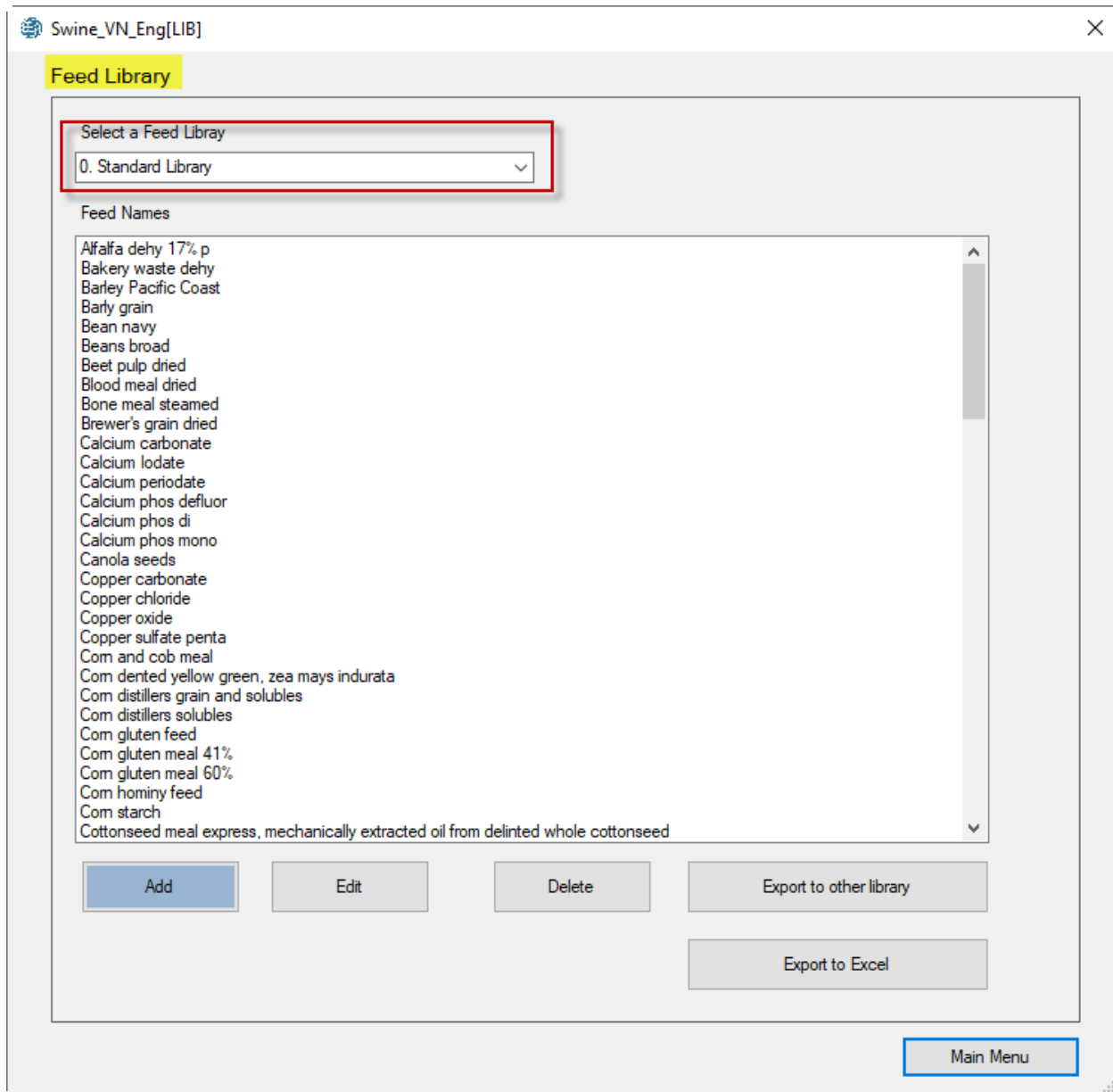
Net Energy for Lactation, Mcal/kg:

$$NEL = 0.0245 * TDN - 0.12$$

Step 5

Converts to English system, if necessary.

FEED LIBRARY EDITOR



There are three feed libraries:

- 0 Standard Feed Library
- 1 Alternate Feed Library
- 2 Infeasible Feed Library

The standard feed library contains 110 standard feeds. Standard feeds are mostly available in the USA. The Alternate feed library is currently empty but will be populated with local feeds from Vietnam. The infeasible feed library contains seven special feeds that are used to trouble shoot the least cost formulation results.

Edit

To edit a feed, navigate to that feed and then press the [Edit] button. The [Feed Nutrient Analysis] dialog box appears as shown below:

Field	Value
Library	0. Standard Library
Feed Number	1
International Feed Number	1-00-023
Feed Name	Alfalfa dehy 17% p
Feed Group	02-Pasture, range plant
Feed Type	2. Concentrate
Region	0. All
Season	0. All
Feed Dry Matter (%)	92
Digestible Energy (Mcal/kg)	2.043
Metabolizable Energy (Mcal/kg)	1.853
Crude Protein (% DM)	18.913
Ether Extract (% DM)	3.043
Linoleic Acid (% DM)	0.511
Crude Fiber (% DM)	26.087
Ash (% DM)	30.543
Calcium (% DM)	1.522
Phosphor (% DM)	0.25
Bio Avail Phosphorus (% DM)	0.25

Library

This is a read only field and it is grayed out.

Feed number

Each feed, in the standard, alternate. Or infeasible feed libraries, has a unique number. Avoid duplicate numbers in the same feed library.

International feed number

This field is optional. Common feedstuffs 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:

9. Dry forages and roughages
10. Pasture, range plants, and forage fed fresh
11. Silage
12. Energy feeds

- 13. Protein supplements
- 14. Mineral supplements
- 15. Vitamin supplements
- 16. Additives

Feed name

Each feed, in the standard, alternate. Or infeasible feed libraries, has a unique name. Avoid duplicate names in the same library.

Feed group

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. Feeds with an identical group number are considered to be members of the same group. There are nine feed groups, as shown below:

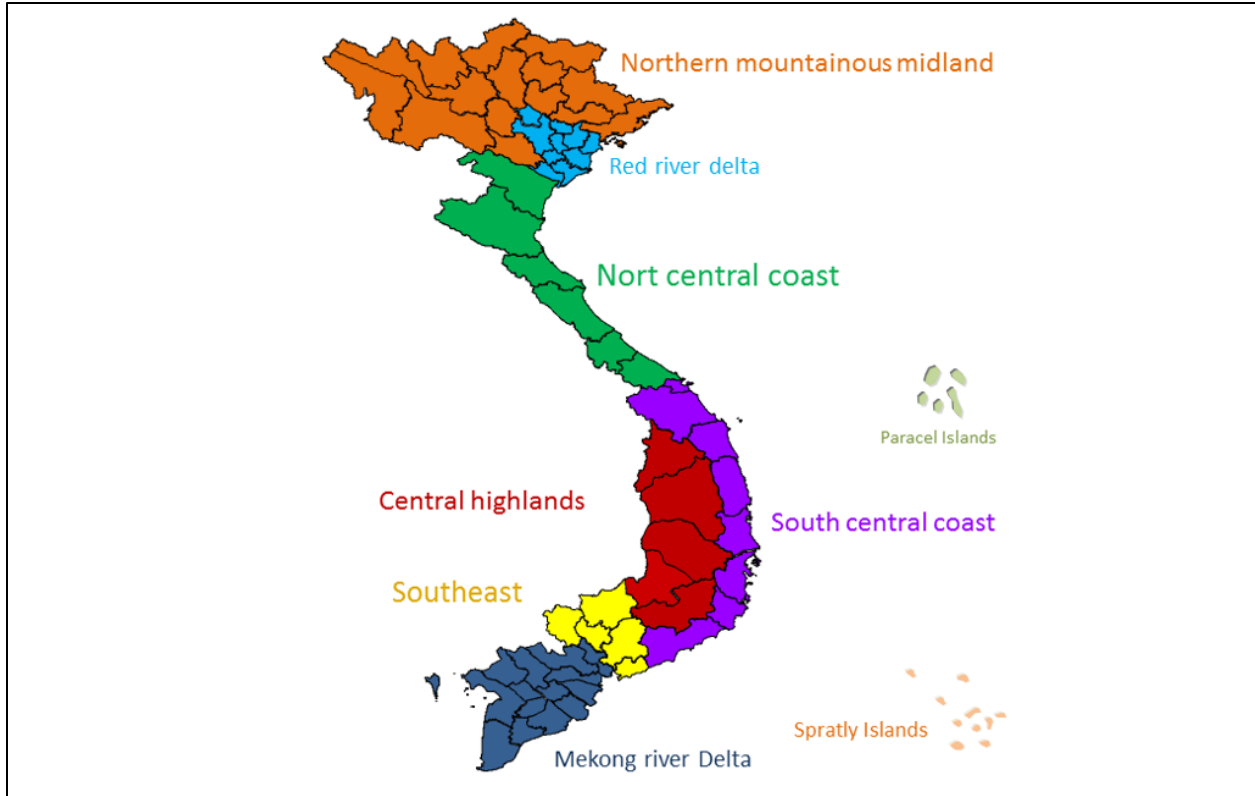
NUMBER	NAME
1	01-Dry forage, roughage
2	02-Pasture, range plant
3	03-Silage
4	04-Energy feeds
5	05-Protein supplements
6	06-Mineral supplements
7	07-Vitamin supplements
8	08-Additives
9	09-Energy and Protein

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.

Region

Specify in what region of country the feed is available. There are seven agro-ecological regions in Vietnam, as shown below:



Region of Vietnam
0. All
1. Northern midland and mountainous
2. Red river delta
3. North Central Coast
4. South Central Coast
5. Central Highlands
6. Southeast
7. Mekong River Delta

Season

Specify in what season of year the feed is available. The typical climate of Vietnam is tropical monsoons. There are four distinct seasons: Spring, Summer, Autumn and Winter in the Northern and North Central regions while there are rainy season and dry season in Southern and South Central regions.

Seasons of Vietnam
0. All
1. Spring
2. Summer
3. Autumn
4. Winter

5. Rainy Season
6. Early Dry Season
7. Dry Season

Feed dry matter

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.

Nutrient Analysis

The nutrients are arranged in five groups: (1) Basic nutrients; (2) Major minerals; (3) Minor minerals; (4) Vitamins; and (5) Amino acids.

Basic Nutrients

Basic nutrients are listed below:

DE	Digestible Energy	Mcal/kg
ME	Metabolizable Energy	Mcal/kg
CP	Crude Protein	% DM
EE	Ether Extract	% DM
CF	Crude Fiber	% DM
ASH	Ash	% DM

Major Minerals

Major minerals are listed below:

CA	Calcium	% DM
P	Phosphor	% DM
BAP	Bio Avail Phosphorus	% DM
NA	Sodium	% DM
CL	Chlorine	% DM
MG	Magnesium	% DM
K	Potassium	% DM
S	Sulfur	% DM

Minor Minerals

Minor minerals are listed below:

CO	Cobalt	ppm
CU	Copper	ppm
F	Fluorine	ppm

I	Iodine	ppm
FE	Iron	ppm
MN	Magnesium	ppm
SE	Selenium	ppm
ZN	Zinc	ppm

Vitamins

Vitamins are listed below:

VITA	Vitamin A	k IU/kg
VITD	Vitamin D	k IU/kg
VITK	Vitamin K	k IU/kg
VITE	Vitamin E	mg/kg
BIOT	Biotin	mg/kg
CHOL	Choline	mg/kg
FOLA	Folacin	mg/kg
NIAC	Niacin	mg/kg
PANT	Pantothenic Acid	mg/kg
RIBO	Riboflavin	mg/kg
THIA	Thiamine	mg/kg
B6	Vitamin B6	mg/kg
B12	Vitamin B12	mg/kg

Amino Acids

The 10 essential amino acids for swine are arginine, histidine, isoleucine, leucine, lysine, methionine plus cystine, phenylalanine plus tyrosine, threonine, tryptophan, and valine. The lysine and the remaining essential amino acids are normally provided in sufficient quantities in corn and soybean meal diets.

Amino acids are listed below:

ARGI	Arginine	% DM
HIST	Histidine	% DM
ISOL	Isoleucine	% DM
LEUC	Leucine	% DM
LYSI	Lysine	% DM
MECY	Methionine plus Cystine	% DM
PHTY	Phenylalanine plus Tyrosine	% DM
THRE	Threonine	% DM
TRYP	Tryptophan	% DM
VALI	Valine	% DM

Add

To add a new feed, press the [ADD] button. The [Feed Nutrient Analysis] dialog box appears. The data entries are like ones described for the Edit operation, described above.

Delete

All 131 feeds in the standard library and all 7 feeds in the infeasible library are locked and cannot be deleted. But if you add your own feeds to these libraries, you can delete them because they will not be locked.

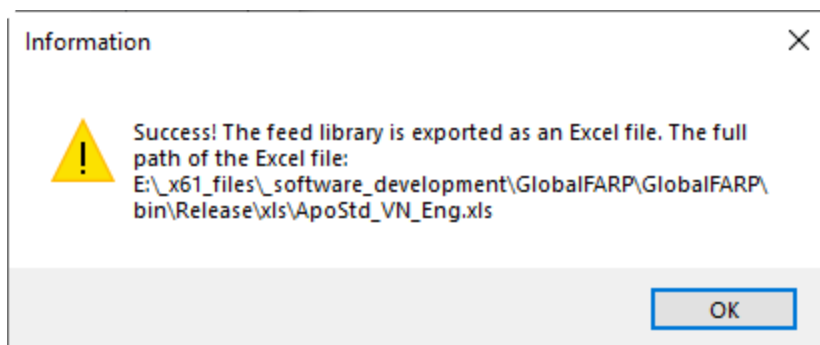
Export to another library

You can export feeds from the standard library to the alternate library and then modify it in the new library. This is one way to populate the alternate library with feeds from the standard library and then modify them to match the local feeds.

Export to Excel

You can export feed libraries to Excel and inspect them in Excel. The exported files will be store in the “xls” subdirector of the main folder of the at: C:\Program Files (x86)\UCDAVIS\GlobalFARP\xls\

If the export operation is successful, the program displays the following message, telling the user where to find the exported Excel file.



The file name for the standard feed library for Vietnam in English is ApoStf_SN_Eng.xls, The file name for the standard feed library for Vietnam in Vietnamese is ApoStf_SN_Vie.xls.

Structure of feed libraries

Each feed library has 76 columns as listed below:

COL	Internal Name	Display Name: English	Metric Unit	Choice_00	Choice_01	Choice_02
1	LIB	Library		0. Standard Library	1. Alternate Library	2. Infeasible Library
2	NAME	Feed Name				
3	NUMBER	Feed Number				
4	PRICE	Feed Price				
5	PRICEUNIT	Feed Price Unit		1. \$/Metric tonne As Fed	2. \$/100 kg As Fed	3. \$/kg As Fed
6	INTFEEDNO	International Feed Number				
7	TYPE	Feed Type		1. Roughage	2. Concentrate	

8	DM	Feed Dry Matter	%			
9	DMBASIS	Dry Matter Basis	%			
10	G1	Feed Group				
11	G2	Second Feed Group				
12	G3	Third Feed Group				
13	G4	Fourth Feed Group		Real Feed	Not Real Feed	
14	MINAMT1	Minimum Amount 1				
15	MINTYPE1	Minimum Type 1				
16	MAXAMT1	Maximum Amount 1				
17	MAXTYPE1	Maximum Type 1				
18	MINAMT2	Minimum Amount 2				
19	MINTYPE2	Minimum Type 2				
20	MAXAMT2	Maximum Amount 2				
21	MAXTYPE2	Maximum Type 2				
22	MINAMT3	Minimum Amount 3				
23	MINTYPE3	Minimum Type 3				
24	MAXAMT3	Maximum Amount 3				
25	MAXTYPE3	Maximum Type 3				
26	AMT_AF	Amount AS FED	kg			
27	AMT_DM	Amount DM	kg			
28	PCT_AF	Percent AS FED	%			
29	PCT_DM	Percent DM	%			
30	AMOUNTUNIT	Feed Amount Unit		kg	g	mg
31	LOCKED	Locked				
32	DE	Digestible Energy	Mcal/kg			
33	ME	Metabolizable Energy	Mcal/kg			
34	CP	Crude Protein	% DM			
35	EE	Ether Extract	% DM			
36	CF	Crude Fiber	% DM			
37	ASH	Ash	% DM			
38	CA	Calcium	% DM			
39	P	Phosphor	% DM			
40	BAP	Bio Avail Phosphorus	% DM			
41	NA	Sodium	% DM			
42	CL	Chlorine	% DM			
43	MG	Magnesium	% DM			
44	K	Potassium	% DM			
45	S	Sulfur	% DM			
46	CO	Cobalt	ppm			
47	CU	Copper	ppm			
48	F	Fluorine	ppm			
49	I	Iodine	ppm			
50	FE	Iron	ppm			
51	MN	Magnesium	ppm			
52	SE	Selenium	ppm			
53	ZN	Zinc	ppm			
54	VITA	Vitamin A	k IU/kg			
55	VITD	Vitamin D	k IU/kg			

56	VITK	Vitamin K	k IU/kg			
57	VITE	Vitamin E	mg/kg			
58	BIOT	Biotin	mg/kg			
59	CHOL	Choline	mg/kg			
60	FOLA	Folacin	mg/kg			
61	NIAC	Niacin	mg/kg			
62	PANT	Pantothenic Acid	mg/kg			
63	RIBO	Riboflavin	mg/kg			
64	THIA	Thiamine	mg/kg			
65	B6	Vitamin B6	mg/kg			
66	B12	Vitamin B12	mg/kg			
67	ARGI	Arginine	% DM			
68	HIST	Histidine	% DM			
69	ISOL	Isoleucine	% DM			
70	LEUC	Leucine	% DM			
71	LYSI	Lysine	% DM			
72	MECY	Methionine plus Cystine	% DM			
73	PHTY	Phenylalanine plus Tyrosine	% DM			
74	THRE	Threonine	% DM			
75	TRYP	Tryptophan	% DM			
76	VALI	Valine	% DM			

Standard feed library:

Basic columns

LIB	NAME	NUMBER	REGION	SEASON	INTFEEDNO	TYP E	DM	G 1	G 2	G 3	G 4	L O C K E D
0	Alfalfa dehy 17% p	1			1-00-023	1	92	1	0	0	0	1
0	Bakery waste dehy	2			4-00-466	1	92	4	9	0	0	1
0	Barley Pacific Coast	3			4-07-939	1	89	4	9	0	0	1
0	Barly grain	4			4-00-549	1	89	4	9	0	0	1
0	Bean navy	5			5-00-623	1	89	5	9	0	0	1
0	Beans broad	6			5-09-262	1	87	5	9	0	0	1
0	Beet pulp dried	7			4-00-669	1	91	4	9	0	0	1
0	Blood meal dried	8			5-00-381	1	93	5	9	0	0	1
0	Bone meal steamed	9			6-00-400	1	100	6	0	0	0	1
0	Brewer's grain dried	10			5-02-141	1	92	5	9	0	0	1
0	Calcium carbonate	11			6-01-069	1	100	6	0	0	0	1
0	Calcium Iodate	12			6-01-075	1	100	6	0	0	0	1
0	Calcium periodate	13			6-28-107	1	100	6	0	0	0	1
0	Calcium phos defluor	14			6-01-080	1	100	6	0	0	0	1
0	Calcium phos di	15			6-28-335	1	100	6	0	0	0	1
0	Calcium phos mono	16			6-26-334	1	100	6	0	0	0	1
0	Canola seeds	17			5-06-145	1	93	5	9	0	0	1
0	Copper carbonate	18			6-01-703	1	100	6	0	0	0	1
0	Copper chloride	19			6-01-706	1	100	6	0	0	0	1
0	Copper oxide	20			6-01-712	1	100	6	0	0	0	1
0	Copper sulfate penta	21			6-01-719	1	100	6	0	0	0	1
0	Corn and cob meal	22			4-28-238	1	87	4	9	0	0	1
0	Corn dented yellow green, zea mays indurata	23			4-02-935	1	88	4	9	0	0	1
0	Corn distillers grain and soluble	24			5-28-236	1	91	5	9	0	0	1
0	Corn distillers soluble	25			5-28-237	1	91	5	9	0	0	1
0	Corn gluten feed	26			5-28-243	1	91	5	9	0	0	1
0	Corn gluten meal 41%	27			5-12-354	1	91	5	9	0	0	1
0	Corn gluten meal 60%	28			5-28-242	1	90	5	9	0	0	1
0	Corn hominy feed	29			4-03-011	1	90	4	9	0	0	1
0	Corn starch	30			4-02-889	1	100	4	0	0	0	1
0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31			5-01-609	1	93	5	9	0	0	1
0	Cottonseed meal solvent extracted	32			5-01-619	1	92	5	9	0	0	1
0	Fat lard	33			4-04-790	1	100	4	0	0	0	1
0	Fat poultry	34			4-00-409	1	100	4	0	0	0	1

0	Fat tallow	35			4-08-127	1	100	4	0	0	0	1
0	Feather meal poultry	36			5-03-795	1	93	5	9	0	0	1
0	Fish meal anchovy	37			5-01-985	1	92	5	9	0	0	1
0	Fish meal herring	38			5-02-000	1	92	5	9	0	0	1
0	Fish meal menhaden	39			5-02-009	1	92	5	9	0	0	1
0	Fish solvent extracted condensed by-product	40			5-01-969	1	50	5	9	0	0	1
0	Glucose monohydrate	41			4-02-15	1	100	4	0	0	0	1
0	Iron carbonate frous	42			6-01-863	1	100	6	0	0	0	1
0	Iron chloride ferric	43			6-28-101	1	100	6	0	0	0	1
0	Iron fumarate frous	44			6-08-097	1	100	6	0	0	0	1
0	Iron oxide ferric	45			6-02-431	1	100	6	0	0	0	1
0	Iron oxide frous	46			6-20-728	1	100	6	0	0	0	1
0	Iron sulfate hepta	47			6-20-734	1	100	6	0	0	0	1
0	Iron sulfate mono	48			6-01-869	1	100	6	0	0	0	1
0	Lysine	49			5-00-005	1	100	5	9	0	0	1
0	Magnasium oxide	50			6-02-756	1	100	6	0	0	0	1
0	Magnasium sulfate	51			6-02-758	1	100	6	0	0	0	1
0	Magnesium carbonate	52			6-02-754	1	100	6	0	0	0	1
0	Manganese carbonate	53			6-03-036	1	100	6	0	0	0	1
0	Manganese chloride	54			6-03-038	1	100	6	0	0	0	1
0	Manganese oxide	55			6-03-056	1	100	6	0	0	0	1
0	Manganese sulfate	56			6-28-103	1	100	6	0	0	0	1
0	Meat & bone 50%	57			5-09-322	1	94	5	9	0	0	1
0	Meat meal 55%	58			5-09-323	1	93	5	9	0	0	1
0	Methionine	59			5-00-006	1	100	5	9	0	0	1
0	Millet proso, Panicum miliaceum, small-seeded cereals	60			4-03-120	1	90	4	9	0	0	1
0	Molasses beet	61			4-00-668	1	78	4	9	0	0	1
0	Molassess cane	62			4-04-696	1	74	4	9	0	0	1
0	Oat groats (dehulled oats)	63			4-03-331	1	87	4	9	0	0	1
0	Oats	64			4-03-309	1	89	4	9	0	0	1
0	Oil corn	65			4-07-882	1	100	4	0	0	0	1
0	Oil soybean	66			4-07-983	1	100	4	0	0	0	1
0	Peanut meal expeller	67			5-03-649	1	93	5	9	0	0	1
0	Peanut meal solvent	68			5-03-650	1	93	5	9	0	0	1
0	Peas	69			5-03-600	1	89	5	9	0	0	1
0	Phosphate curacao	70			6-05-586	1	100	6	0	0	0	1
0	Phosphate defluorin	71			6-01-780	1	100	6	0	0	0	1
0	Phosphate rock soft	72			6-03-947	1	100	6	0	0	0	1
0	Potassium chloride	73			6-03-755	1	100	6	0	0	0	1
0	Potassium iodide	74			6-03-759	1	100	6	0	0	0	1

0	Premix Mineral, Illinois State University	75			6-00-002	1	100	6	0	0	0	1
0	Premix Norm	76			5-00-007	1	100	5	9	0	0	1
0	Premix Vit-Min, Illinois State University	77			7-00-003	1	100	6	7	0	0	1
0	Premix Vit-Min, University of California Davis	78			7-00-004	1	100	6	7	0	0	1
0	Premix Vitamin, Illinois State University	79			7-00-001	1	100	7	0	0	0	1
0	Rice Bran with Germ Solubles	80			4-03-930	1	91	4	9	0	0	1
0	Rice grainn polished	81			4-03-932	1	89	4	9	0	0	1
0	Rice polishings	82			4-03-943	1	90	4	9	0	0	1
0	Rye grain	83			4-04-047	1	87	4	9	0	0	1
0	Safflower meal solvent extracted	84			5-04-110	1	92	5	9	0	0	1
0	Sesame meal expeller extracted	85			5-04-220	1	93	5	9	0	0	1
0	Skim milk dried	86			5-01-175	1	94	5	9	0	0	1
0	Sodium chloride	87			6-03-755	1	100	6	0	0	0	1
0	Sodium phosphate mon	88			6-04-288	1	100	6	0	0	0	1
0	Sodium selenite	89			6-26-013	1	100	6	0	0	0	1
0	Sorghum grain milo	90			4-04-444	1	89	4	9	0	0	1
0	Soybean dehul sol	91			5-04-612	1	90	5	9	0	0	1
0	Soybean fullfat cook	92			5-04-597	1	90	5	9	0	0	1
0	Soybean solvent extracted	93			5-04-604	1	90	5	9	0	0	1
0	Sucrose	94			2-04-701	1	100	4	0	0	0	1
0	Sunflower dehulled solvent extracted	95			5-04-739	1	93	5	9	0	0	1
0	Threonine amino acid	96			5-00-008	1	100	5	9	0	0	1
0	Triticale grain, a hybrid of wheat and rye	97			4-20-362	1	90	4	9	0	0	1
0	Tryptophan amino acid	98			5-00-009	1	100	5	9	0	0	1
0	Wheat bran, by-product of dry milling of common wheat	99			4-05-190	1	87	4	9	0	0	1
0	Wheat hard red winter	100			4-05-268	1	88	4	9	0	0	1
0	Wheat middlings	101			4-05-205	1	89	4	9	0	0	1
0	Wheat shorts	102			4-05-201	1	88	4	9	0	0	1
0	Wheat soft red winter	103			4-05-294	1	88	4	9	0	0	1
0	Whey dried	104			4-01-182	1	93	4	9	0	0	1
0	Whey low lactose dried, by-product	105			4-01-186	1	93	4	9	0	0	1
0	Yeast brewer's dried	106			7-05-527	1	93	7	0	0	0	1
0	Zinc carbonate	107			6-05-549	1	100	6	0	0	0	1
0	Zinc oxide	108			6-06-553	1	100	6	0	0	0	1
0	Zinc sulfate hepta	109			6-20-729	1	100	6	0	0	0	1
0	Zinc sulfate mono	110			6-05-555		100	6	0	0	0	1

Standard Feed Library

Basic Nutrients

LIB	NAME	NUMBER	DE	ME	CP	EE	LINO	CF	ASH
0	Alfalfa dehy 17% p	1	2.043	1.853	18.91	3.043	0.51	26.09	30.54
0	Bakery waste dehy	2	4.329	4.063	10.65	12.72	0	1.304	4.196
0	Barley Pacific Coast	3	3.476	3.279	10.67	2.247	0.96	7.303	1.618
0	Barly grain	4	3.506	3.416	12.92	1.91	0.93	5.618	1.551
0	Bean navy	5	4.173	3.793	25.39	1.461	0	5.056	3.011
0	Beans broad	6	4.057	3.559	30.69	1.149	0	8.391	3.414
0	Beet pulp dried	7	3.162	2.969	9.67	0.549	0	20	1.736
0	Blood meal dried	8	3.204	2.505	92.47	1.29	0.11	1.075	2.43
0	Bone meal steamed	9	0	0	0	0	0	0	61.02
0	Brewer's grain dried	10	2.272	2.065	29.67	7.174	3.2	14.24	2.196
0	Calcium carbonate	11	0	0	0	0	0	0	53.83
0	Calcium iodate	12	0	0	0	0	0	0	10
0	Calcium periodate	13	0	0	0	0	0	0	31.01
0	Calcium phos defluor	14	0	0	0	0	0	0	60.43
0	Calcium phos di	15	0	0	0	0	0	0	62.51
0	Calcium phos mono	16	0	0	0	0	0	0	68
0	Canola seeds	17	3.118	2.903	40.86	4.086	0	11.94	4.333
0	Copper carbonate	18	0	0	0	0	0	0	0.17
0	Copper chloride	19	0	0	0	0	0	0	41.18
0	Copper oxide	20	0	0	0	0	0	0	0
0	Copper sulfate penta	21	0	0	0	0	0	0	12.8
0	Corn and cob meal	22	3.594	3.393	8.966	3.678	0	9.425	1.264
0	Corn dented yellow green, zea mays indurata	23	4.011	3.886	9.659	4.091	2.5	2.614	1.08
0	Corn distillers grain and solubles	24	4	3.665	29.67	10.22	5	10	3.088
0	Corn distillers solubles	25	3.659	3.236	31.32	9.231	5	4.835	6.418
0	Corn gluten feed	26	3.467	2.962	25.6	2.967	0	7.473	3.56
0	Corn gluten meal 41%	27	4.714	4.264	46.26	2.527	0	4.176	1.593
0	Corn gluten meal 60%	28	4.517	3.983	68	2	0	2	1.833
0	Corn hominy feed	29	3.883	3.678	11.78	6.333	3.64	5.556	1.922
0	Corn starch	30	8.919	8.908	0	0	0	0	0
0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31	3.204	2.935	39.57	5.484	2.66	15.38	3.118
0	Cottonseed meal solvent extracted	32	2.902	2.777	45.33	1.957	0	11.74	2.152
0	Fat lard	33	17.33	17.09	0	100	18.3	0	0
0	Fat poultry	34	19.04	17.59	0	100	11.8	0	0
0	Fat tallow	35	18.08	17.41	0	100	3.1	0	0
0	Feather meal poultry	36	2.934	2.38	91.29	3.118	0	1.505	4.591
0	Fish meal anchovy	37	3.279	2.691	71.2	4.457	0.22	1.087	12.67
0	Fish meal herring	38	4.179	3.402	78.26	9.239	0.16	0.761	9.565
0	Fish meal menhaden	39	4.13	3.587	66.52	10.44	0.13	0.978	14.48
0	Fish solvent extracted condensed by-product	40	3.818	3.246	63	12.2	0	1	16.94
0	Glucose monohydrate	41	8.236	7.982	0	0	0	0	0
0	Iron carbonate frous	42	0	0	0	0	0	0	0
0	Iron chloride ferric	43	0	0	0	0	0	0	39.35
0	Iron fumarate frous	44	0	0	0	0	0	0	0
0	Iron oxide ferric	45	0	0	0	0	0	0	0.43
0	Iron oxide frous	46	0	0	0	0	0	0	0
0	Iron sulfate hepta	47	0	0	0	0	0	0	12.1
0	Iron sulfate mono	48	0	0	0	0	0	0	18
0	Lysine	49	0	0	0	0	0	0	0

0	Magnasium oxide	50	0	0	0	0	0	0	57.9
0	Magnasium sulfate	51	0	0	0	0	0	0	22.37
0	Magnesium carbonate	52	0	0	0	0	0	0	30.22
0	Manganese carbonate	53	0	0	0	0	0	0	0
0	Manganese chloride	54	0	0	0	0	0	0	35.47
0	Manganese oxide	55	0	0	0	0	0	0	0
0	Manganese sulfate	56	0	0	0	0	0	0	18.97
0	Meat & bone 50%	57	2.702	2.426	54.15	10.32	0.38	2.553	22.76
0	Meat meal 55%	58	3.016	2.597	59.79	9.355	0.3	2.473	19.94
0	Methionine	59	0	0	0	0	0	0	0
0	Millet proso, Panicum miliaceum, small-seeded cereals	60	3.637	3.397	12.89	3.889	0	6.778	1.056
0	Molasses beet	61	3.218	3.051	8.462	0.256	0	0	10.27
0	Molasses cane	62	2.986	2.709	5.946	0.135	0	0	9.365
0	Oat groats (dehulled oats)	63	4.316	3.925	18.16	7.011	0	2.874	1.598
0	Oats	64	3.101	3.073	13.26	5.281	1.65	12.02	1.562
0	Oil corn	65	16.8	16.21	0	100	58	0	0
0	Oil soybean	66	16.67	16.05	0	100	65.7	0	0
0	Peanut meal expeller	67	4.36	3.989	52.9	6.022	1.54	6.667	2.817
0	Peanut meal solvent	68	3.376	3.129	52.69	1.398	0.26	10.65	3
0	Peas	69	3.815	3.556	26.07	1.236	0	6.18	2.191
0	Phosphate curacao	70	0	0	0	0	0	0	51.8
0	Phosphate defluorin	71	0	0	0	0	0	0	59
0	Phosphate rock soft	72	0	0	0	0	0	0	28.28
0	Potassium chloride	73	0	0	0	0	0	0	99.14
0	Potassium iodide	74	0	0	0	0	0	0	21
0	Premix Mineral, Illinois State University	75	0	0	0	0	0	0	0
0	Premix Norm	76	0	0	0	0	0	0	0
0	Premix Vit-Min, Illinois State University	77	0	0	0	0	0	0	262.3
0	Premix Vit-Min, University of California Davis	78	0	0	1.596	0	0	0.66	7.641
0	Premix Vitamin, Illinois State University	79	0	0	0	0	0	0	0
0	Rice Bran with Germ Solubles	80	3.445	3.148	15.39	1.648	0	14.18	3.901
0	Rice grainn polished	81	3.938	3.699	7.865	0.674	0	0.674	0.599
0	Rice polishings	82	4.126	3.809	13.22	14	3.98	3.556	4.911
0	Rye grain	83	3.776	3.454	13.79	1.724	0	2.529	1.471
0	Safflower meal solvent extracted	84	3.217	2.647	24.89	1.304	0	33.15	2.598
0	Sesame meal expeller extracted	85	3.64	3.199	48.39	9.355	2.04	6.022	6.247
0	Skim milk dried	86	4.09	3.798	35.43	1.17	0	0.213	7.266
0	Sodium chloride	87	0	0	0	0	0	0	100
0	Sodium phosphate mon	88	0	0	0	0	0	0	59.78
0	Sodium selenite	89	0	0	0	0	0	0	29.07
0	Sorghum grain milo	90	3.837	3.685	10	3.146	1.27	2.472	1.101
0	Soybean dehul sol	91	4.089	3.761	53.89	1	0.44	3.778	4.422
0	Soybean fullfat cook	92	4.483	4.028	40.78	20.89	9.4	5.778	3.444
0	Soybean solvent extracted	93	3.878	3.578	48.89	1.222	0.44	8.111	4.533
0	Sucrose	94	8.489	8.092	0	0	0	0	0
0	Sunflower dehulled solvent extracted	95	3.276	2.839	48.93	3.118	1.71	12.58	4.151
0	Threonine amino acid	96	0	0	0	0	0	0	0
0	Triticale grain, a hybrid of wheat and rye	97	3.666	3.389	17.56	1.667	0	4.444	1.111
0	Tryptophan amino acid	98	0	0	0	0	0	0	0
0	Wheat bran, by-product of dry milling of common wheat	99	2.724	2.477	17.82	4.598	1.95	11.49	4.368
0	Wheat hard red winter	100	3.866	3.75	14.32	1.818	0.67	2.955	1.534
0	Wheat middlings	101	3.461	3.331	18.54	4.831	2.1	8.764	3.449
0	Wheat shorts	102	3.477	3.256	18.75	5.227	0	7.273	3.136

0	Wheat soft red winter	103	3.866	3.75	12.96	1.818	0	2.614	1.443
0	Whey dried	104	3.457	3.323	14.3	0.86	0.01	0.215	7.828
0	Whey low lactose dried, by-product	105	3.155	2.951	17.96	1.075	0.01	0.215	11.39
0	Yeast brewer's dried	106	3.543	3.081	47.1	0.968	0	3.226	5.312
0	Zinc carbonate	107	0	0	0	0	0	0	0
0	Zinc oxide	108	0	0	0	0	0	0	0
0	Zinc sulfate hepta	109	0	0	0	0	0	0	10.93
0	Zinc sulfate mono	110	0	0	0	0	0	0	17.54

Standard Feed Library: Major Minerals

LIB	NAME	NUMBER	CA	P	BAP	NA	CL	MG	K	S
0	Alfalfa dehy 17% p	1	1.52	0.25	0.25	0.11	0.51	0.32	2.59	25
0	Bakery waste dehy	2	0.14	0.26	0.13	1.24	1.61	0.26	0.53	0.02
0	Barley Pacific Coast	3	0.06	0.38	0.12	0.02	0.17	0.14	0.57	0.16
0	Barly grain	4	0.06	0.38	0.12	0.03	0.12	0.15	0.52	0.17
0	Bean navy	5	0.18	0.58	0.26	0.05	0.07	0.15	1.47	0.26
0	Beans broad	6	0.16	0.62	0.18	0.92	0	0.15	1.38	0
0	Beet pulp dried	7	0.68	0.1	0	0.2	0.04	0.28	0.22	0.22
0	Blood meal dried	8	0.44	0.32	0.3	0.41	0.27	0.16	0.16	0.37
0	Bone meal steamed	9	29.8	12.5	10.2	5.53	0	0.32	0.18	2.44
0	Brewer's grain dried	10	0.32	0.55	0.39	0.22	0.14	0.16	0.1	0.32
0	Calcium carbonate	11	38	0	15.7	0.02	0	0.05	0.06	0
0	Calcium iodate	12	10	0	0	0	0	0	0	0
0	Calcium periodate	13	31	0	0	0	0	0	0	0
0	Calcium phos defluor	14	21.3	18.7	18.7	0.05	0	0.57	0	1.11
0	Calcium phos di	15	26.3	18.1	18.1	0	0	0	0.07	0
0	Calcium phos mono	16	22	23	23	0	0	0	0	0
0	Canola seeds	17	0.73	1.26	0.27	0	0	0.69	1.39	0
0	Copper carbonate	18	0	0	0	0	0	0	0	0.17
0	Copper chloride	19	0	0	0	0	41.2	0	0	0
0	Copper oxide	20	0	0	0	0	0	0	0	0
0	Copper sulfate penta	21	0	0	0	0	0	0	0	12.8
0	Corn and cob meal	22	0.07	0.28	0.02	0.02	0.05	0.14	0.53	0.16
0	Corn dented yellow green, zea mays indurata	23	0.03	0.32	0.03	0.01	0.06	0.13	0.38	0.13
0	Corn distillers grain and solubles	24	0.15	0.73	0.52	0.57	0.18	0.18	0.44	0.33
0	Corn distillers solubles	25	0.33	1.58	1.12	0.25	0.29	0.65	1.8	0.4
0	Corn gluten feed	26	0.2	1.09	0.64	0.17	0.28	0.34	0.54	0.32
0	Corn gluten meal 41%	27	0.14	0.44	0.26	0.11	0	0.06	0.03	0.55
0	Corn gluten meal 60%	28	0	0.49	0.29	0.06	0.08	0.08	0.21	0.63
0	Corn hominy feed	29	0.07	0.58	0.08	0.11	0.07	0.2	0.68	0.14
0	Corn starch	30	0	0	0	0	0	0	0	0
0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31	0.22	0.76	0.01	0.04	0.02	0.46	1.33	0.27
0	Cottonseed meal solvent extracted	32	0.19	1.27	0.01	0.04	0	0.45	0.2	0
0	Fat lard	33	0	0	0	0	0	0	0	0
0	Fat poultry	34	0	0	0	0	0	0	0	0
0	Fat tallow	35	0	0	0	0	0	0	0	0
0	Feather meal poultry	36	0.32	0.67	0.45	0.75	0.3	0.19	0.29	1.61
0	Fish meal anchovy	37	4.05	2.64	2.64	1.2	0.32	0.26	0.98	0.59
0	Fish meal herring	38	2.39	1.82	1.82	0.64	1.08	0.15	1.17	0.5

0	Fish meal menhaden	39	5.64	3.13	3.13	0.45	0.6	0.16	0.76	0.61
0	Fish solvent extracted condensed by-product	40	0.32	1.14	1.14	4.9	5.86	0.06	3.28	0.24
0	Glucose monohydrate	41	0	0	0	0	0	0	0	0
0	Iron carbonate frous	42	0	0	0	0	0	0	0	0
0	Iron chloride ferric	43	0	0	0	0	39.4	0	0	0
0	Iron fumarate frous	44	0	0	0	0	0	0	0	0
0	Iron oxide ferric	45	0.03	0	0	0	0	0.4	0	0
0	Iron oxide frous	46	0	0	0	0	0	0	0	0
0	Iron sulfate hepta	47	0	0	0	0	0	0	0	12.1
0	Iron sulfate mono	48	0	0	0	0	0	0	0	18
0	Lysine	49	0	0	0	0	0	0	0	0
0	Magnasium oxide	50	3	0	0	0	0	54.9	0	0
0	Magnasium sulfate	51	0.02	0	0	0	0	9.6	0	12.8
0	Magnesium carbonate	52	0.02	0	0	0	0	30.2	0	0
0	Manganese carbonate	53	0	0	0	0	0	0	0	0
0	Manganese chloride	54	0	0	0	0	35.5	0	0	0
0	Manganese oxide	55	0	0	0	0	0	0	0	0
0	Manganese sulfate	56	0	0	0	0	0	0	0	19
0	Meat & bone 50%	57	10	4.87	3.31	0.78	0.79	1.2	1.53	0.28
0	Meat meal 55%	58	8.89	4.41	3	1.24	0.98	0.29	0.59	0.54
0	Methionine	59	0	0	0	0	0	0	0	0
0	Millet proso, Panicum miliaceum, small-seeded cereals	60	0.03	0.33	0.03	0	0	0.18	0.48	0
0	Molasses beet	61	0.15	0.04	0	1.49	1.64	0.3	6.06	0.59
0	Molasses cane	62	1.04	0.11	0.03	0.22	3.05	0.42	4.03	0.47
0	Oat groats (dehulled oats)	63	0.09	0.49	0.1	0.06	0.09	0.13	0.4	0.23
0	Oats	64	0.09	0.38	0.09	0.06	0.1	0.16	0.45	0.24
0	Oil corn	65	0	0	0	0	0	0	0	0
0	Oil soybean	66	0	0	0	0	0	0	0	0
0	Peanut meal expeller	67	0.22	0.6	0.08	0.13	0.03	0.28	1.25	0.24
0	Peanut meal solvent	68	0.29	0.66	0.08	0.08	0.03	0.29	1.25	0.33
0	Peas	69	0.14	0.46	0.23	0.05	0.06	0.14	1.14	0
0	Phosphate curacao	70	34	14	2.8	0.2	0	0.8	0	0
0	Phosphate defluorin	71	32	18	3.6	4.9	0	0.42	0.08	0
0	Phosphate rock soft	72	17	9	1.8	0.1	0	0.38	0	0
0	Potassium chloride	73	0.05	0	0	1	47.3	0.34	50	0.45
0	Potassium iodide	74	0	0	0	0	0	0	21	0
0	Premix Mineral, Illinois State University	75	0	0	0	0	0	0	0	0
0	Premix Norm	76	0	0	0	0	0	0	0	0
0	Premix Vit-Min, Illinois State University	77	22.8	9.5	0	0	0	230	0	0
0	Premix Vit-Min, University of California Davis	78	7.64	0	0	0	0	0	0	0
0	Premix Vitamin, Illinois State University	79	0	0	0	0	0	0	0	0
0	Rice Bran with Germ Solubles	80	0.12	1.51	0.45	0	0	0	1.63	0.2
0	Rice grainn polished	81	0.03	0.15	0.07	0.08	0.09	0.12	0.02	0.05
0	Rice polishings	82	0.06	1.49	0.89	0.08	0.12	0.67	1.42	0.19
0	Rye grain	83	0.07	0.37	0.16	0.02	0.03	0.13	0.52	0.17
0	Safflower meal solvent extracted	84	0.37	0.83	0.02	0.05	0	0.37	0.82	0.14
0	Sesame meal expeller extracted	85	2.16	1.46	0.31	0.05	0.08	0.5	1.34	0.34
0	Skim milk dried	86	1.36	1.09	1.09	0.61	0.96	0.13	1.7	0.34
0	Sodium chloride	87	0	0	0	39.3	60.7	0	0	0
0	Sodium phosphate mon	88	0	21.8	21.8	16.2	0	0	0	0

0	Sodium selenite	89	0	0	0	29.1	0	0	0	0
0	Sorghum grain milo	90	0.03	0.32	0.03	0.05	0.09	0.15	0.35	0.09
0	Soybean dehul sol	91	0.29	0.71	0.18	0.01	0.04	0.33	2.37	0.49
0	Soybean fullfat cook	92	0.29	0.68	0.18	0.03	0.03	0.24	1.74	0.24
0	Soybean solvent extracted	93	0.33	0.72	0.26	0.04	0.04	0.32	2.34	0.47
0	Sucrose	94	0	0	0	0	0	0	0	0
0	Sunflower dehulled solvent extracted	95	0.45	1.01	0.03	0.24	0.17	0.74	1.28	0.23
0	Threonine amino acid	96	0	0	0	0	0	0	0	0
0	Triticale grain, a hybrid of wheat and rye	97	0.06	0.33	0.16	0	0	0	0.4	0.17
0	Tryptophan amino acid	98	0	0	0	0	0	0	0	0
0	Wheat bran, by-product of dry milling of common wheat	99	0.15	1.33	0.47	0.06	0.06	0.66	1.4	0.24
0	Wheat hard red winter	100	0.05	0.42	0.21	0.02	0.06	0.14	0.49	0.16
0	Wheat middlings	101	0.15	1	0.45	0.14	0.05	0.38	1.1	0.19
0	Wheat shorts	102	0.1	0.91	0.43	0.03	0.06	0.31	1.06	0.24
0	Wheat soft red winter	103	0.06	0.41	0.19	0.01	0.08	0.11	0.46	0.13
0	Whey dried	104	0.93	0.82	0.62	1.4	1.61	0.14	1.19	1.12
0	Whey low lactose dried, by-product	105	1.71	1.61	0.86	1.55	1.11	0.23	3.17	1.15
0	Yeast brewer's dried	106	0.15	1.46	1.11	0.08	0.08	0.26	1.72	0.46
0	Zinc carbonate	107	0	0	0	0	0	0	0	0
0	Zinc oxide	108	0	0	0	0	0	0	0	0
0	Zinc sulfate hepta	109	0	0	0	0	0	0	0	10.9
0	Zinc sulfate mono	110	0.02	0	0	0	0.02	0	0	17.5

Standard Feed Library

Minor Minerals

LIB	NAME	NUMBER	CO	CU	F	I	FE	MN	SE	ZN
0	Alfalfa dehy 17% p	1	0	10.87	0	0	439.1	33.7	0.359	20.65
0	Bakery waste dehy	2	0	5.435	0	0	4.783	33.7	0	16.3
0	Barley Pacific Coast	3	0	9.101	0	0	96.63	17.98	0.112	16.85
0	Barly grain	4	0	8.539	0	0	82.02	17.98	0.18	19.1
0	Bean navy	5	0	11.24	0	0	111.2	23.6	0	0
0	Beans broad	6	0	4.713	0	0	80.46	9.655	0	48.28
0	Beet pulp dried	7	0	13.74	0	0	292.3	37.58	0	1.099
0	Blood meal dried	8	0	8.817	0	0	2.977	6.882	0	0
0	Bone meal steamed	9	0	0	0	0	26000	0	0	100
0	Brewer's grain dried	10	0	23.59	0	0	253.3	40.44	0.761	29.35
0	Calcium carbonate	11	0	0	0	0	300	300	0	0
0	Calcium Iodate	12	0	0	0	6E+05	0	0	0	0
0	Calcium periodate	13	0	0	0	4E+05	0	0	0	0
0	Calcium phos defluor	14	10	10	1800	0	14000	300	0	100
0	Calcium phos di	15	0	0	0	0	0	300	0	0
0	Calcium phos mono	16	0	100	0	0	0	0	0	200
0	Canola seeds	17	0	11.18	0	0	171	57.96	1.075	76.34
0	Copper carbonate	18	0	6E+05	0	0	1500	0	0	200
0	Copper chloride	19	0	4E+05	0	0	0	0	0	0
0	Copper oxide	20	0	8E+05	0	0	0	0	0	0
0	Copper sulfate penta	21	0	3E+05	0	0	0	0	0	0
0	Corn and cob meal	22	0	8.046	0	0	90.81	13.79	0.092	13.79

0	Corn dented yellow green, zea mays indurata	23	0	3.977	0	0	37.5	6.477	0.08	21.59
0	Corn distillers grain and solubles	24	0	58.02	0	0	259.3	25.06	0.385	0
0	Corn distillers solubles	25	0	89.01	0	0	609.9	80	0.396	92.31
0	Corn gluten feed	26	0	51.87	0	0	469.2	25.93	0.297	71.43
0	Corn gluten meal 41%	27	0	30.77	0	0	439.6	8.022	1.099	0
0	Corn gluten meal 60%	28	0	29	0	0	254.4	7	0.922	34.44
0	Corn hominy feed	29	0	14.89	0	0	74.44	16.67	0.167	3.333
0	Corn starch	30	0	0	0	0	0	0	0	0
0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31	0	22.58	0	0	149.5	23.66	0	0
0	Cottonseed meal solvent extracted	32	0	20.65	0	0	119.6	22.83	0	66.3
0	Fat lard	33	0	0	0	0	0	0	0	0
0	Fat poultry	34	0	0	0	0	0	0	0	0
0	Fat tallow	35	0	0	0	0	0	0	0	0
0	Feather meal poultry	36	0	7.849	0	0	81.72	12.8	0.978	77.42
0	Fish meal anchovy	37	0	10.11	0	0	239.1	10.33	1.478	112
0	Fish meal herring	38	0	6.087	0	0	123.9	5.217	2.12	135.9
0	Fish meal menhaden	39	0	11.2	0	0	591.3	40.22	2.337	156.5
0	Fish solvent extracted condensed by-product	40	0	93.2	0	0	552	26.4	3.94	86
0	Glucose monohydrate	41	0	0	0	0	0	0	0	0
0	Iron carbonate frous	42	0	0	0	0	4E+05	0	0	0
0	Iron chloride ferric	43	0	0	0	0	2E+05	0	0	0
0	Iron fumarate frous	44	0	0	0	0	3E+05	0	0	0
0	Iron oxide ferric	45	0	0	0	0	6E+05	3000	0	0
0	Iron oxide frous	46	0	0	0	0	8E+05	0	0	0
0	Iron sulfate hepta	47	0	0	0	0	2E+05	0	0	0
0	Iron sulfate mono	48	0	0	0	0	3E+05	0	0	0
0	Lysine	49	0	0	0	0	0	0	0	0
0	Magnasium oxide	50	0	200	0	0	0	100	0	0
0	Magnasium sulfate	51	0	0	0	0	0	0	0	0
0	Magnesium carbonate	52	0	0	0	0	210	0	0	0
0	Manganese carbonate	53	0	0	0	0	0	5E+05	0	0
0	Manganese chloride	54	0	0	0	0	0	3E+05	0	0
0	Manganese oxide	55	0	0	0	0	0	8E+05	0	0
0	Manganese sulfate	56	0	0	0	0	0	3E+05	0	0
0	Meat & bone 50%	57	0	1.596	0	0	540.4	13.3	0.266	94.68
0	Meat meal 55%	58	0	10.43	0	0	474.2	10.22	0.43	86.02
0	Methionine	59	0	0	0	0	0	0	0	0
0	Millet proso, Panicum miliaceum, small-seeded cereals	60	0	0	0	0	78.89	0	0	0
0	Molasses beet	61	0	21.54	0	0	87.18	5.769	0	17.95
0	Molassess cane	62	0	79.73	0	0	264.9	59.05	0	21.62
0	Oat groats (dehulled oats)	63	0	6.897	0	0	83.91	31.95	0	0
0	Oats	64	0	6.742	0	0	71.91	40.23	0.236	39.33
0	Oil corn	65	0	0	0	0	0	0	0	0
0	Oil soybean	66	0	0	0	0	0	0	0	0
0	Peanut meal expeller	67	0	16.56	0	0	167.7	27.42	0.301	35.48
0	Peanut meal solvent	68	0	16.13	0	0	152.7	29.03	0	21.51
0	Peas	69	0	0	0	0	73.03	3.258	0	25.84
0	Phosphate curacao	70	0	0	5400	0	3500	0	0	0

0	Phosphate defluorin	71	10	20	1800	0	6700	200	0	60
0	Phosphate rock soft	72	0	0	15000	0	19000	40	0	90
0	Potassium chloride	73	0	0	0	0	600	0	0	0
0	Potassium iodide	74	0	0	0	7E+05	0	0	0	0
0	Premix Mineral, Illinois State University	75	0	3800	0	80	50300	5700	110	56800
0	Premix Norm	76	0	0	0	0	0	0	0	0
0	Premix Vit-Min, Illinois State University	77	0	150	0	3.1	2010	0	4.6	2270
0	Premix Vit-Min, University of California Davis	78	0	3528	0	8822	22051	13233	27.01	33075
0	Premix Vitamin, Illinois State University	79	0	0	0	0	0	0	0	0
0	Rice Bran with Germ Solubles	80	0	14.29	0	0	205.5	255.2	0.44	32.97
0	Rice grainn polished	81	0	0	0	0	0	20.23	0.303	19.1
0	Rice polishings	82	0	3.333	0	0	178.9	13.33	0	28.89
0	Rye grain	83	0	8.736	0	0	72.41	66.67	0.437	32.18
0	Safflower meal solvent extracted	84	0	10.76	0	0	540.2	19.78	0	44.57
0	Sesame meal expeller extracted	85	0	0	0	0	8.602	2.258	0.129	41.94
0	Skim milk dried	86	0	11.7	0	0	8.511	2.234	0.128	41.49
0	Sodium chloride	87	0	0	0	0	0	0	0	0
0	Sodium phosphate mon	88	0	0	0	0	0	0	0	0
0	Sodium selenite	89	0	0	0	0	0	0	4E+05	0
0	Sorghum grain milo	90	0	11.24	0	0	53.93	17.75	0.225	19.1
0	Soybean dehul sol	91	0	22.56	0	0	145.6	41.33	0.111	63.33
0	Soybean fullfat cook	92	0	17.78	0	0	88.89	33.33	0.122	17.78
0	Soybean solvent extracted	93	0	25.56	0	0	155.6	34	0.111	57.78
0	Sucrose	94	0	0	0	0	0	0	0	0
0	Sunflower dehulled solvent extracted	95	0	4.301	0	0	33.33	20.32	2.29	105.4
0	Threonine amino acid	96	0	0	0	0	0	0	0	0
0	Triticale grain, a hybrid of wheat and rye	97	0	0	0	0	0	0	0	0
0	Tryptophan amino acid	98	0	0	0	0	0	0	0	0
0	Wheat bran, by-product of dry milling of common wheat	99	0	12.64	0	0	166.7	132.2	0.736	109.2
0	Wheat hard red winter	100	0	5.795	0	0	39.77	34.55	0.33	39.77
0	Wheat middlings	101	0	17.87	0	0	67.42	128.2	0.831	109
0	Wheat shorts	102	0	13.07	0	0	82.96	129.7	0.545	115.9
0	Wheat soft red winter	103	0	7.955	0	0	32.96	37.96	0.045	47.73
0	Whey dried	104	0	50	0	0	181.7	6.344	0	3.226
0	Whey low lactose dried, by-product	105	0	7.527	0	0	263.4	8.602	0.054	8.602
0	Yeast brewer's dried	106	0	41.29	0	0	117.2	7.204	0.978	41.94
0	Zinc carbonate	107	0	0	0	0	0	0	0	5E+05
0	Zinc oxide	108	0	0	0	0	0	0	0	8E+05
0	Zinc sulfate hepta	109	0	0	0	0	0	0	0	2E+05
0	Zinc sulfate mono	110	0	0	0	0	10	10	0	4E+05

Standard Feed Library

Vitamins

LIB	NAME	NUMBER	VITA	VITD	VITK	VITE	BIOT	CHOL	FOLA
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0	Alfalfa dehy 17% p	1	0	0	0	120.652	0.359	1488.043	4.78
0	Bakery waste dehy	2	0	0	0	44.565	0.076	1003.261	0.22
0	Barley Pacific Coast	3	0	0	0	29.438	0.169	1096.629	0.56
0	Barly grain	4	0	0	0	24.719	0.169	1.164	0.67
0	Bean navy	5	0	0	0	1.124	0.124	1506.742	1.46
0	Beans broad	6	0	0	0	1.149	0.103	1919.54	0
0	Beet pulp dried	7	0	0	0	0	0	901.099	0
0	Blood meal dried	8	0	0	0	0	0.301	645.161	0.43
0	Bone meal steamed	9	0	0	0	0	0	0	0
0	Brewer's grain dried	10	0	0	0	29.022	0.685	1795.652	0.22
0	Calcium carbonate	11	0	0	0	0	0	0	0
0	Calcium Iodate	12	0	0	0	0	0	0	0
0	Calcium periodate	13	0	0	0	0	0	0	0
0	Calcium phos defluor	14	0	0	0	0	0	0	0
0	Calcium phos di	15	0	0	0	0	0	0	0
0	Calcium phos mono	16	0	0	0	0	0	0	0
0	Canola seeds	17	0	0	0	0	0.968	7204.301	2.47
0	Copper carbonate	18	0	0	0	0	0	0	0
0	Copper chloride	19	0	0	0	0	0	0	0
0	Copper oxide	20	0	0	0	0	0	0	0
0	Copper sulfate penta	21	0	0	0	0	0	0	0
0	Corn and cob meal	22	0	0	0	20	0.046	411.494	0.23
0	Corn dented yellow green, zea mays indurata	23	0	0	0	23.75	0.08	572.727	0.34
0	Corn distillers grain and solubles	24	0	0	0	42.967	0.846	2803.297	0.99
0	Corn distillers solubles	25	0	0	0	55.495	1.791	5150.549	1.43
0	Corn gluten feed	26	0	0	0	15.165	0.363	1679.121	0.33
0	Corn gluten meal 41%	27	0	0	0	34.066	0.165	362.637	0.22
0	Corn gluten meal 60%	28	0	0	0	26	0.211	391.111	0.33
0	Corn hominy feed	29	0	0	0	0	0.144	1283.333	0.33
0	Corn starch	30	0	0	0	0	0	0	0
0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31	0	0	0	0	0	0	0
0	Cottonseed meal solvent extracted	32	0	0	0	17.391	0.598	3004.348	1.52
0	Fat lard	33	0	0	0	0	0	0	0
0	Fat poultry	34	0	0	0	0	0	0	0
0	Fat tallow	35	0	0	0	0	0	0	0
0	Feather meal poultry	36	0	0	0	0	0.043	961.29	0.22
0	Fish meal anchovy	37	0	0	0	5.435	0.25	4791.304	0.22
0	Fish meal herring	38	0	0	0	24.022	0.533	5723.913	0.33
0	Fish meal menhaden	39	0	0	0	7.391	0.196	3.383	0.22
0	Fish solvent extracted condensed by-product	40	0	0	0	0	0.28	6740	0.4
0	Glucose monohydrate	41	0	0	0	0	0	0	0
0	Iron carbonate frous	42	0	0	0	0	0	0	0
0	Iron chloride ferric	43	0	0	0	0	0	0	0
0	Iron fumarate frous	44	0	0	0	0	0	0	0
0	Iron oxide ferric	45	0	0	0	0	0	0	0
0	Iron oxide frous	46	0	0	0	0	0	0	0
0	Iron sulfate hepta	47	0	0	0	0	0	0	0
0	Iron sulfate mono	48	0	0	0	0	0	0	0
0	Lysine	49	0	0	0	0	0	0	0
0	Magnasium oxide	50	0	0	0	0	0	0	0

0	Magnasium sulfate	51	0	0	0	0	0	0	0
0	Magnesium carbonate	52	0	0	0	0	0	0	0
0	Manganese carbonate	53	0	0	0	0	0	0	0
0	Manganese chloride	54	0	0	0	0	0	0	0
0	Manganese oxide	55	0	0	0	0	0	0	0
0	Manganese sulfate	56	0	0	0	0	0	0	0
0	Meat & bone 50%	57	0	0	0	1.17	0.149	2272.34	0.53
0	Meat meal 55%	58	0	0	0	1.075	0.118	2066.667	0.54
0	Methionine	59	0	0	0	0	0	0	0
0	Millet proso, Panicum miliaceum, small-seeded cereals	60	0	0	0	0	0	488.889	0
0	Molasses beet	61	0	0	0	5.641	0	1060.256	0
0	Molassess cane	62	0	0	0	7.297	0.905	951.351	0.14
0	Oat groats (dehulled oats)	63	0	0	0	17.011	0	1300	0.58
0	Oats	64	0	0	0	16.742	0.303	1086.517	0.45
0	Oil corn	65	0	0	0	0	0	0	0
0	Oil soybean	66	0	0	0	0	0	0	0
0	Peanut meal expeller	67	0	0	0	2.581	0.355	2123.656	0.75
0	Peanut meal solvent	68	0	0	0	3.118	0.355	2038.71	0.75
0	Peas	69	0	0	0	3.371	0.202	614.607	0.23
0	Phosphate curacao	70	0	0	0	0	0	0	0
0	Phosphate defluorin	71	0	0	0	0	0	0	0
0	Phosphate rock soft	72	0	0	0	0	0	0	0
0	Potassium chloride	73	0	0	0	0	0	0	0
0	Potassium iodide	74	0	0	0	0	0	0	0
0	Premix Mineral, Illinois State University	75	0	0	0	0	0	0	0
0	Premix Norm	76	0	0	0	0	0	0	0
0	Premix Vit-Min, Illinois State University	77	110.229	13.227	88.18	0.573	6.613	0	0
0	Premix Vit-Min, University of California Davis	78	2205.42	882.17	0.582	3528.66	26.46	147762.77	0
0	Premix Vitamin, Illinois State University	79	1102.5	132.3	881.8	5.733	66.14	0	0
0	Rice Bran with Germ Solubles	80	0	0	0	66.703	0.462	1239.56	2.42
0	Rice grainn polished	81	0	0	0	0	0	986.517	0
0	Rice polishings	82	0	0	0	100.222	0.689	1386.667	0
0	Rye grain	83	0	0	0	16.667	0.069	481.609	0.69
0	Safflower meal solvent extracted	84	0	0	0	0.978	1.554	886.957	0.44
0	Sesame meal expeller extracted	85	0	0	0	9.785	0.355	1498.925	0.65
0	Skim milk dried	86	0	0	0	9.681	0.351	1482.979	0.64
0	Sodium chloride	87	0	0	0	0	0	0	0
0	Sodium phosphate mon	88	0	0	0	0	0	0	0
0	Sodium selenite	89	0	0	0	0	0	0	0
0	Sorghum grain milo	90	0	0	0	13.596	0.258	716.854	0.23
0	Soybean dehul sol	91	0	0	0	3.667	0.356	3058.889	0.78
0	Soybean fullfat cook	92	0	0	0	0	0.333	2772.222	4
0	Soybean solvent extracted	93	0	0	0	2.667	0.356	2898.889	0.67
0	Sucrose	94	0	0	0	0	0	0	0
0	Sunflower dehulled solvent extracted	95	0	0	0	11.935	0	3905.376	0
0	Threonine amino acid	96	0	0	0	0	0	0	0
0	Triticale grain, a hybrid of wheat and rye	97	0	0	0	0	0	513.333	0

0	Tryptophan amino acid	98	0	0	0	0	0	0	0
0	Wheat bran, by-product of dry milling of common wheat	99	0	0	0	16.437	0.437	1416.092	2.07
0	Wheat hard red winter	100	0	0	0	12.614	0.125	1140.909	0.46
0	Wheat middlings	101	0	0	0	26.854	0.27	1401.124	1.35
0	Wheat shorts	102	0	0	0	61.364	0	1928.409	1.71
0	Wheat soft red winter	103	0	0	0	17.727	0	1013.636	0.46
0	Whey dried	104	0	0	0	0.215	0.376	1924.731	0.97
0	Whey low lactose dried, by-product	105	0	0	0	0	0.538	4404.301	0.97
0	Yeast brewer's dried	106	0	0	0	2.258	1.118	4.137	10.4
0	Zinc carbonate	107	0	0	0	0	0	0	0
0	Zinc oxide	108	0	0	0	0	0	0	0
0	Zinc sulfate hepta	109	0	0	0	0	0	0	0
0	Zinc sulfate mono	110	0	0	0	0	0	0	0

Standard Feed Library

Vitamins (continued)

LIB	NAME	NUMBER	NIAC	PANT	RIBO	THIA	B6	B12
0	Alfalfa dehy 17% p	1	40.22	32.28	14.02	3.696	7.826	0
0	Bakery waste dehy	2	28.26	9.022	1.522	3.152	4.674	0
0	Barley Pacific Coast	3	52.81	7.978	1.685	4.719	3.258	0
0	Barly grain	4	85.39	8.876	1.798	5.056	6.517	6.616
0	Bean navy	5	28.09	2.36	2.022	7.079	0.337	0
0	Beans broad	6	25.29	3.448	1.839	6.322	0	0
0	Beet pulp dried	7	18.68	1.538	0.769	0.44	0	0
0	Blood meal dried	8	23.66	3.441	3.118	0.323	4.731	0.014
0	Bone meal steamed	9	0	0	0	0	0	0
0	Brewer's grain dried	10	47.83	8.913	1.63	0.652	0.761	0.004
0	Calcium carbonate	11	0	0	0	0	0	0
0	Calcium Iodate	12	0	0	0	0	0	0
0	Calcium periodate	13	0	0	0	0	0	0
0	Calcium phos defluor	14	0	0	0	0	0	0
0	Calcium phos di	15	0	0	0	0	0	0
0	Calcium phos mono	16	0	0	0	0	0	0
0	Canola seeds	17	172	10.22	3.978	5.591	0	0
0	Copper carbonate	18	0	0	0	0	0	0
0	Copper chloride	19	0	0	0	0	0	0
0	Copper oxide	20	0	0	0	0	0	0
0	Copper sulfate penta	21	0	0	0	0	0	0
0	Corn and cob meal	22	19.54	4.828	1.034	3.333	6.897	0
0	Corn dented yellow green, zea mays indurata	23	26.14	5.795	1.25	4.205	7.045	0
0	Corn distillers grain and solubles	24	79.12	15.28	9.121	3.077	6.374	0
0	Corn distillers solubles	25	134.1	25.17	18.68	7.253	11.98	0.003
0	Corn gluten feed	26	78.02	15.06	2.527	2.198	15.06	0
0	Corn gluten meal 41%	27	58.24	12.53	2.198	0.22	8.791	0
0	Corn gluten meal 60%	28	66.67	3.889	2.222	0.333	7.333	0
0	Corn hominy feed	29	51.11	8.778	2.444	8.889	12.22	0
0	Corn starch	30	0	0	0	0	0	0

0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31	0	0	3.333	0	0	0
0	Cottonseed meal solvent extracted	32	44.57	14.89	5.217	3.587	6.087	0
0	Fat lard	33	0	0	0	0	0	0
0	Fat poultry	34	0	0	0	0	0	0
0	Fat tallow	35	0	0	0	0	0	0
0	Feather meal poultry	36	22.58	9.57	2.151	0.108	4.731	0.087
0	Fish meal anchovy	37	108.7	16.3	7.717	0.109	4.348	0.383
0	Fish meal herring	38	92.39	18.8	10.54	0.435	5	0.467
0	Fish meal menhaden	39	59.78	9.348	5.217	0.652	5.109	0.134
0	Fish solvent extracted condensed by-product	40	352	71.4	25.8	11	24.4	1.014
0	Glucose monohydrate	41	0	0	0	0	0	0
0	Iron carbonate frous	42	0	0	0	0	0	0
0	Iron chloride ferric	43	0	0	0	0	0	0
0	Iron fumarate frous	44	0	0	0	0	0	0
0	Iron oxide ferric	45	0	0	0	0	0	0
0	Iron oxide frous	46	0	0	0	0	0	0
0	Iron sulfate hepta	47	0	0	0	0	0	0
0	Iron sulfate mono	48	0	0	0	0	0	0
0	Lysine	49	0	0	0	0	0	0
0	Magnasium oxide	50	0	0	0	0	0	0
0	Magnasium sulfate	51	0	0	0	0	0	0
0	Magnesium carbonate	52	0	0	0	0	0	0
0	Manganese carbonate	53	0	0	0	0	0	0
0	Manganese chloride	54	0	0	0	0	0	0
0	Manganese oxide	55	0	0	0	0	0	0
0	Manganese sulfate	56	0	0	0	0	0	0
0	Meat & bone 50%	57	54.26	4.681	4.787	0.213	9.255	0.231
0	Meat meal 55%	58	56.99	5.269	5.699	0.215	4.946	0.098
0	Methionine	59	0	0	0	0	0	0
0	Millet proso, Panicum miliaceum, small-seeded cereals	60	25.56	12.22	4.222	8.111	0	0
0	Molasses beet	61	52.56	5.769	2.949	0	0	0
0	Molassess cane	62	48.65	50.54	3.784	1.216	5.676	0
0	Oat groats (dehulled oats)	63	11.49	15.75	1.379	7.471	1.149	0
0	Oats	64	15.73	8.764	1.573	6.742	2.809	0
0	Oil corn	65	0	0	0	0	0	0
0	Oil soybean	66	0	0	0	0	0	0
0	Peanut meal expeller	67	186	51.18	9.785	6.129	6.559	0
0	Peanut meal solvent	68	191.4	50.11	9.785	6.129	6.452	0
0	Peas	69	34.83	21.01	2.022	5.169	2.247	0
0	Phosphate curacao	70	0	0	0	0	0	0
0	Phosphate defluorin	71	0	0	0	0	0	0
0	Phosphate rock soft	72	0	0	0	0	0	0
0	Potassium chloride	73	0	0	0	0	0	0
0	Potassium iodide	74	0	0	0	0	0	0
0	Premix Mineral, Illinois State University	75	0	0	0	0	0	0
0	Premix Norm	76	0	0	0	0	0	0
0	Premix Vit-Min, Illinois State University	77	551.1	440.9	132.3	0	0	551.1

0	Premix Vit-Min, University of California Davis	78	11027	5514	1544	441.1	0	7.72
0	Premix Vitamin, Illinois State University	79	5511	4409	1323	0	0	55.12
0	Rice Bran with Germ Solubles	80	312.1	25.28	3.187	24.84	31.98	0
0	Rice grainn polished	81	25.84	3.708	0.449	1.573	0	0
0	Rice polishings	82	562.2	51.56	2	22.22	31	0
0	Rye grain	83	16.09	8.621	1.954	4.713	2.989	0
0	Safflower meal solvent extracted	84	11.96	40.54	2.174	0	0	0
0	Sesame meal expeller extracted	85	11.83	39.14	20.54	3.978	4.409	0
0	Skim milk dried	86	11.7	38.72	20.32	3.936	4.362	0.054
0	Sodium chloride	87	0	0	0	0	0	0
0	Sodium phosphate mon	88	0	0	0	0	0	0
0	Sodium selenite	89	0	0	0	0	0	0
0	Sorghum grain milo	90	41.57	12.36	1.236	4.607	5.281	0
0	Soybean dehul sol	91	24.44	16.44	3.222	3.444	5.333	0
0	Soybean fullfat cook	92	25.56	17.89	3	0	0	0
0	Soybean solvent extracted	93	31.11	18.11	3.222	6.667	6.667	0
0	Sucrose	94	0	0	0	0	0	0
0	Sunflower dehulled solvent extracted	95	260.2	43.66	3.763	3.333	17.2	0
0	Threonine amino acid	96	0	0	0	0	0	0
0	Triticale grain, a hybrid of wheat and rye	97	0	0	0.444	0	0	0
0	Tryptophan amino acid	98	0	0	0	0	0	0
0	Wheat bran, by-product of dry milling of common wheat	99	226.4	32.18	4.138	9.655	11.84	0
0	Wheat hard red winter	100	60.23	11.48	1.477	5.114	3.409	0
0	Wheat middlings	101	106.7	20	2.247	15.96	10.23	0
0	Wheat shorts	102	119.3	24.89	4.659	22.16	8.182	0
0	Wheat soft red winter	103	60.23	11.48	1.705	5.341	3.636	0
0	Whey dried	104	11.83	49.68	29.46	4.301	3.441	0.02
0	Whey low lactose dried, by-product	105	19.36	80.11	51.18	5.376	4.839	0.039
0	Yeast brewer's dried	106	476.3	119	36.67	91.61	39.46	0.002
0	Zinc carbonate	107	0	0	0	0	0	0
0	Zinc oxide	108	0	0	0	0	0	0
0	Zinc sulfate hepta	109	0	0	0	0	0	0
0	Zinc sulfate mono	110	0	0	0	0	0	0

Standard Feed Library

Essential Amino Acids

LIB	NAME	NUMBER	ARGI	HIST	ISOL	LEUC	LYSI	MECY	PHTY	THRE	TRYP	VALI
0	Alfalfa dehy 17% p	1	0.8	0.4	0.9	1.4	0.9	0.6	1.5	0.8	0.4	1
0	Bakery waste dehy	2	0.5	0.4	0.9	1.4	0.9	0.6	1.5	0.8	0.4	1
0	Barley Pacific Coast	3	0.5	0.2	0.4	0.7	0.3	0.4	0.9	0.3	0.1	0.5
0	Barly grain	4	9.6	0.3	0.5	0.8	0.4	0.4	1	0.4	0.2	0.6
0	Bean navy	5	1.3	0	0	0	1.4	0.5	0	0	0.3	0
0	Beans broad	6	2.8	0.8	1.2	2.3	1.9	0.6	2.3	1.1	0.3	1.4
0	Beet pulp dried	7	0.3	0.2	0.3	0.7	0.7	0	0.8	0.4	0.1	0.4
0	Blood meal dried	8	3.9	5.6	1	12	8	2.2	8.8	3.9	1.1	8.1
0	Bone meal steamed	9	0	0	0	0	0	0	0	0	0	0

0	Brewer's grain dried	10	1.4	9.3	1.7	2.8	1	0.9	2.8	1	0.4	1.7
0	Calcium carbonate	11	0	0	0	0	0	0	0	0	0	0
0	Calcium iodate	12	0	0	0	0	0	0	0	0	0	0
0	Calcium periodate	13	0	0	0	0	0	0	0	0	0	0
0	Calcium phos defluor	14	0	0	0	0	0	0	0	0	0	0
0	Calcium phos di	15	0	0	0	0	0	0	0	0	0	0
0	Calcium phos mono	16	0	0	0	0	0	0	0	0	0	0
0	Canola seeds	17	2.5	1.2	1.6	2.8	2.4	1.2	2.6	1.8	0.5	2.1
0	Copper carbonate	18	0	0	0	0	0	0	0	0	0	0
0	Copper chloride	19	0	0	0	0	0	0	0	0	0	0
0	Copper oxide	20	0	0	0	0	0	0	0	0	0	0
0	Copper sulfate penta	21	0	0	0	0	0	0	0	0	0	0
0	Corn and cob meal	22	0.4	0.2	0.4	1	0.2	0.3	0.8	0.3	0.1	0.4
0	Corn dented yellow green, zea mays indurata	23	0.5	0.3	0.4	1.4	0.3	0.5	1	0.4	0.1	0.5
0	Corn distillers grain and solubles	24	1.1	0.7	1.5	2.4	0.8	0.9	2.4	1	0.2	1.6
0	Corn distillers solubles	25	1.1	0.7	1.4	2.5	1	1.1	2.5	1.1	0.3	1.7
0	Corn gluten feed	26	0.9	0.7	1	2.4	0.7	0.9	1.7	0.9	0.2	1.2
0	Corn gluten meal 41%	27	1.5	1.1	2.5	6.6	0.9	1.9	4.2	1.6	0.2	2.4
0	Corn gluten meal 60%	28	2.3	1.6	2.8	12	1.1	3.1	8.2	2.5	0.3	3.5
0	Corn hominy feed	29	0.6	0.2	0.4	1	0.4	0.3	0.9	0.4	0.1	0.6
0	Corn starch	30	0	0	0	0	0	0	0	0	0	0
0	Cottonseed meal express, mechanically extracted oil from delinted whole cottonseed	31	4.6	1	1.4	2.3	1.6	1.4	3.2	1.3	0.6	2.2
0	Cottonseed meal solvent extracted	32	4.6	1.1	1.3	2.4	1.8	1.2	3.4	1.3	0.5	1.8
0	Fat lard	33	0	0	0	0	0	0	0	0	0	0
0	Fat poultry	34	0	0	0	0	0	0	0	0	0	0
0	Fat tallow	35	0	0	0	0	0	0	0	0	0	0
0	Feather meal poultry	36	5.7	0.5	3.8	6.9	1.8	4	6.4	3.9	0.6	6.3
0	Fish meal anchovy	37	4.1	1.7	3.4	5.4	5.5	2.8	5.4	3	0.8	3.8
0	Fish meal herring	38	5.1	1.8	3.4	5.7	6.1	3.1	5.4	3.1	0.8	4.7
0	Fish meal menhaden	39	4.1	1.6	3.1	4.9	4.9	2.5	4.8	2.7	0.7	3.5
0	Fish solvent extracted condensed by-product	40	3.3	3.1	2.2	3.9	3.7	2.2	3.1	1.8	0.7	2.5
0	Glucose monohydrate	41	0	0	0	0	0	0	0	0	0	0
0	Iron carbonate frous	42	0	0	0	0	0	0	0	0	0	0
0	Iron chloride ferric	43	0	0	0	0	0	0	0	0	0	0
0	Iron fumarate frous	44	0	0	0	0	0	0	0	0	0	0
0	Iron oxide ferric	45	0	0	0	0	0	0	0	0	0	0
0	Iron oxide frous	46	0	0	0	0	0	0	0	0	0	0
0	Iron sulfate hepta	47	0	0	0	0	0	0	0	0	0	0
0	Iron sulfate mono	48	0	0	0	0	0	0	0	0	0	0
0	Lysine	49	0	0	0	0	98	0	0	0	0	0
0	Magnasium oxide	50	0	0	0	0	0	0	0	0	0	0
0	Magnasium sulfate	51	0	0	0	0	0	0	0	0	0	0
0	Magnesium carbonate	52	0	0	0	0	0	0	0	0	0	0
0	Manganese carbonate	53	0	0	0	0	0	0	0	0	0	0
0	Manganese chloride	54	0	0	0	0	0	0	0	0	0	0
0	Manganese oxide	55	0	0	0	0	0	0	0	0	0	0
0	Manganese sulfate	56	0	0	0	0	0	0	0	0	0	0
0	Meat & bone 50%	57	3.9	1	1.6	3.2	3.1	1.2	2.6	1.7	0.3	2.3
0	Meat meal 55%	58	4.1	1.1	2	3.8	3.3	1.5	3.1	1.9	0.4	2.8
0	Methionine	59	0	0	0	0	0	99	0	0	0	0

0	Millet proso, Panicum miliaceum, small-seeded cereals	60	0.4	0.2	0.5	1.3	0.3	0.3	0.6	0.4	0.2	0.6
0	Molasses beet	61	0	0	0	0	0	0	0	0	0	0
0	Molasses cane	62	0	0	0	0	0	0	0	0	0	0
0	Oat groats (dehulled oats)	63	1	0.3	0.6	1.1	0.6	0.5	1.3	0.5	0.2	0.8
0	Oats	64	0.8	0.2	0.5	1	0.4	0.4	1.1	0.4	0.2	0.7
0	Oil corn	65	0	0	0	0	0	0	0	0	0	0
0	Oil soybean	66	0	0	0	0	0	0	0	0	0	0
0	Peanut meal expeller	67	5.5	1.1	1.9	3.4	1.8	1.3	4.3	1.4	0.5	2.5
0	Peanut meal solvent	68	6.3	1.6	2	3.5	1.6	1.3	2.3	1.5	0.5	2.3
0	Peas	69	1.6	0.7	1.3	2	1.7	0.5	1.4	1.1	0.2	1.4
0	Phosphate curacao	70	0	0	0	0	0	0	0	0	0	0
0	Phosphate defluorin	71	0	0	0	0	0	0	0	0	0	0
0	Phosphate rock soft	72	0	0	0	0	0	0	0	0	0	0
0	Potassium chloride	73	0	0	0	0	0	0	0	0	0	0
0	Potassium iodide	74	0	0	0	0	0	0	0	0	0	0
0	Premix Mineral, Illinois State University	75	0	0	0	0	0	0	0	0	0	0
0	Premix Norm	76	0	0	0	0	0	0	0	0	0	0
0	Premix Vit-Min, Illinois State University	77	0	0	0	0	0	0	0	0	0	0
0	Premix Vit-Min, University of California Davis	78	0	0	0	0	0	0	0	0	0	0
0	Premix Vitamin, Illinois State University	79	0	0	0	0	0	0	0	0	0	0
0	Rice Bran with Germ Solubles	80	1.1	0.4	0.6	1.1	0.7	0.5	1.2	0.6	0.2	0.8
0	Rice grainn polished	81	0.6	0.2	0.4	0.8	0.3	0.2	0.9	0.3	0.1	0.5
0	Rice polishings	82	0.6	0.2	0.4	0.8	0.6	0.4	1	0.4	0.1	0.8
0	Rye grain	83	0.6	0.3	0.5	0.8	0.5	0.4	0.9	0.4	0.1	0.7
0	Safflower meal solvent extracted	84	2.1	0.6	0.3	1.3	0.8	0.8	1.1	0.6	0.3	1.1
0	Sesame meal expeller extracted	85	4.9	1.2	2.1	3.4	1.4	2.1	4.3	1.7	0.8	2.5
0	Skim milk dried	86	1.2	0.9	2.3	3.5	2.7	1.4	2.9	1.7	0.5	2.4
0	Sodium chloride	87	0	0	0	0	0	0	0	0	0	0
0	Sodium phosphate mon	88	0	0	0	0	0	0	0	0	0	0
0	Sodium selenite	89	0	0	0	0	0	0	0	0	0	0
0	Sorghum grain milo	90	0.4	0.3	0.5	1.5	0.3	0.3	1	0.3	0.1	0.6
0	Soybean dehul sol	91	4.1	1.3	2.4	4	3.5	1.6	3.9	2.1	0.8	2.7
0	Soybean fullfat cook	92	2.8	1	1.8	2.9	2.5	1.1	3.4	1.6	0.6	1.4
0	Soybean solvent extracted	93	3.6	1.2	2.2	3.7	3.2	1.3	4	1.9	0.7	2.2
0	Sucrose	94	0	0	0	0	0	0	0	0	0	0
0	Sunflower dehulled solvent extracted	95	3.9	1	2.1	3	1.8	1.7	3	1.8	0.6	2.4
0	Threonine amino acid	96	0	0	0	0	0	0	0	98	0	0
0	Triticale grain, a hybrid of wheat and rye	97	1	0.4	0.7	1.3	0.6	0.6	1.5	0.6	0.2	0.9
0	Tryptophan amino acid	98	0	0	0	0	0	0	0	0	98	0
0	Wheat bran, by-product of dry milling of common wheat	99	1	0.4	0.6	1	0.6	0.5	1	0.5	0.3	0.8
0	Wheat hard red winter	100	0.7	0.3	0.6	1	0.5	0.6	1.3	0.4	0.2	0.7
0	Wheat middlings	101	1.1	0.4	0.8	1.2	0.8	0.5	1.2	0.6	0.2	0.9
0	Wheat shorts	102	1.4	0.5	0.6	1.2	0.9	0.8	1.3	0.7	0.3	0.9
0	Wheat soft red winter	103	0.7	0.4	0.5	1	0.4	0.7	1.1	0.4	0.3	0.7
0	Whey dried	104	0.4	0.2	0.8	1.3	1	0.5	0.6	1	0.2	0.7

0	Whey low lactose dried, by-product	105	0.6	0.3	1	1.7	1.5	0.9	1.1	1	0.3	0.9
0	Yeast brewer's dried	106	2.4	1.2	2.2	3.4	3.5	1.3	3.3	2.2	0.5	2.4
0	Zinc carbonate	107	0	0	0	0	0	0	0	0	0	0
0	Zinc oxide	108	0	0	0	0	0	0	0	0	0	0
0	Zinc sulfate hepta	109	0	0	0	0	0	0	0	0	0	0
0	Zinc sulfate mono	110	0	0	0	0	0	0	0	0	0	0

Alternate Feed Library

The alternate feed library is populated with local feeds in Vietnam.

Infeasible feed library

The infeasible feed library has seven feeds as listed below. The library code for these feeds are "2"

LIB	NAME	NUMBER
2	OINK Vitamin Premix	1
2	OINK Mineral premix	2
2	OINK Calcium	3
2	OINK Phosphorus	4
2	OINK Energy	5
2	OINK Protein	6
2	OINK Filler	7

The word OINK in English (especially in children's books) is used in writing to represent the noise that a pig makes. We use this word to indicate that these feeds are special feeds used by the program to indicate that the ration is missing some essential nutrients such as energy, protein, minerals, or vitamins. These feeds have very high prices, preventing them from being included in the least cost ration unless where it is absolutely necessary.

Feed Groups

The program supports eight feed groups as listed below:

NAME	NUMBER	LOCKED
01-Dry forage, roughage	1	1
02-Pasture, range plant	2	1
03-Silage	3	1
04-Energy feeds	4	1
05-Protein supplements	5	1
06-Mineral supplements	6	1
07-Vitamin supplements	7	1
08-Additives	8	1
09-Energy and Protein	9	1

The program currently does not provide any utility to modify this database, but we are planning to add this capacity in future releases of the software.