CTR DAIRY 2018

User's Manual

CTRDAIRY 2018

A WithinDay Feeding Strategy Evaluator for Grazing Dairy Cows
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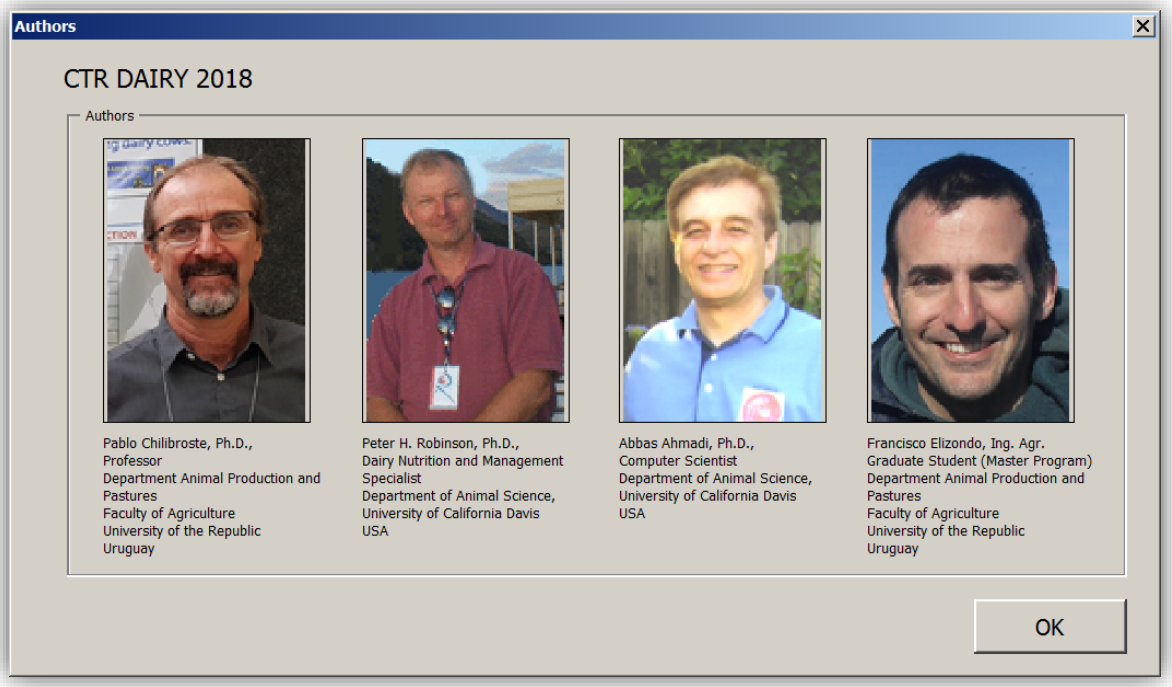
Pablo Chilibroste, Ph.D., Professor
Department Animal Production and Pastures EEMAC
Faculty of Agriculture
University of the Republic
Uruguay
Peter H. Robinson, Ph.D., Dairy Nutrition and Management Specialist
Abbas Ahmadi, Ph.D., Software Engineer
Department of Animal Science,
University of California Davis
USA
Francisco Elizondo, Ing. Agr.
Graduate Student (Master Program)
Department Animal Production and Pastures
Faculty of Agriculture
University of the Republic
Uruguay

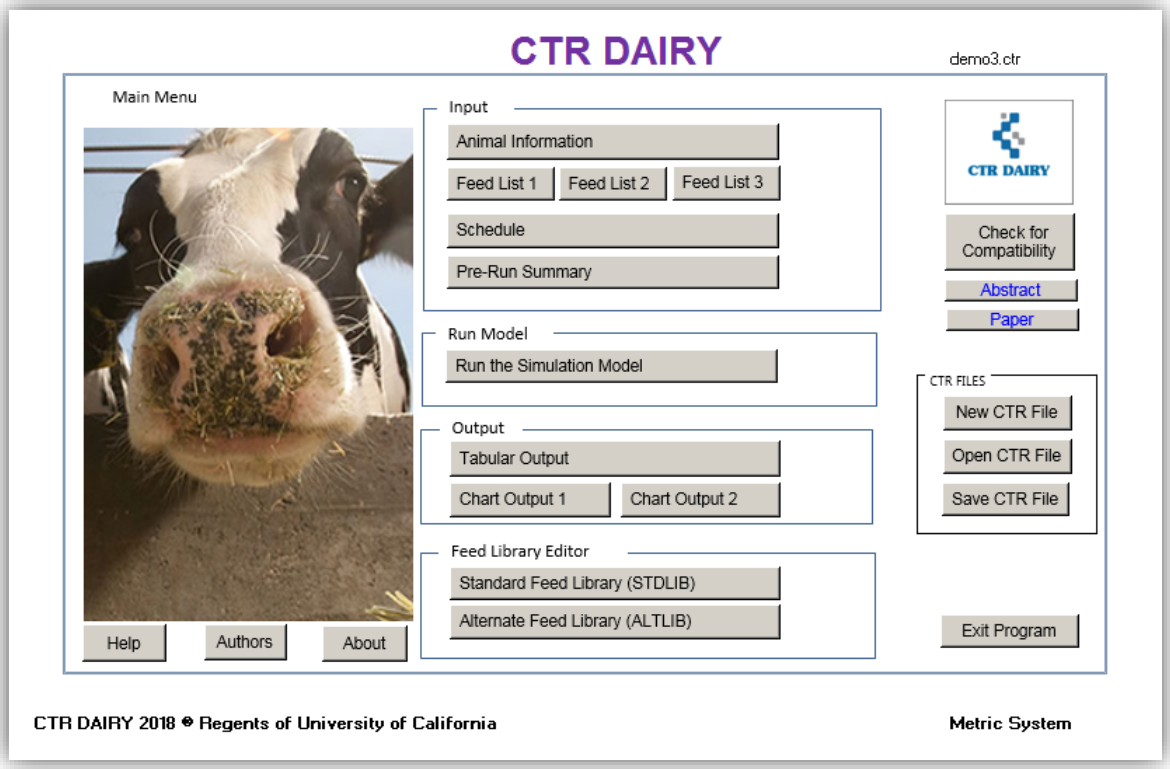
Contact information:
Extension Software Support
Department of Animal Science
University of California
1 Shields Ave, Davis, CA 95616 USA
Phone: (530) 7521278
Fax: (530) 7520175
Email: software@asmail.ucdavis.edu
Web address: http://animalscience.ucdavis.edu/extension/software/ctrdairy/

AUTHORS



Papblo Chilibroste, Ph.D.,
Professor
Department Animal Production and Pastures
Faculty of Agriculture
University of the Republic
Uruguay
Peter H. Robinson, Ph.D.,
Dairy Nutrition and Management Specialist
Department of Animal Science,
University of California Davis
USA
Abbas Ahmadi, Ph.D.,
Computer Scientist
Department of Animal Science,
University of California Davis
USA
Francisco Elizondo, Ing. Agr.
Graduate Student (Master Program)
Department Animal Production and Pastures
Faculty of Agriculture
University of the Republic
Uruguay
fjeli10@gmail.com

MAIN MENU



DESCRIPTION

CTR Dairy is a computer program designed to simulate rumen events and digestion of nutrients, as well as predict performance, of lactating dairy cattle as a result of discontinuous feeding patterns using up to three defined 'feeds' fed up to 24 times per day for each feed. A 'feed' could be a hay, silage, pasture, grain, protein meal, mixed supplement or even a totally mixed ration.

CTR Dairy will be particularly useful for persons who graze dairy cattle and/or feed barn mixes and/or feed hays or silages along bunk lines. CTR Dairy can be used to answer questions such as:

Q1 If I graze my cows at 11:00 am rather than at 9:00 am, do I make more or less money?

Q2 What is the best time of the day to supplement grazing cows with a silage and/or grain mix?

Q3 What is the best feeding sequence of grazing and supplementing my grazing dairy cows?

OPERATION

Start by entering values in the 'Animal Information' tab. Then select the feeds to create your feed lists from the Standard and/or Alternate feed libraries. Then proceed to specify the daily feeding schedule of the feed list combinations. Using these inputs, CTR Dairy can run a simulation model to create outputs of predicted milk production, a profit projection and other key parameters that describe the efficiency of rumen fermentation and digestion of nutrients. You can compare outputs of many input scenarios to determine the optimum daily feeding schedule.

CTR DAIRY FILES

The CTR Dairy files (*.ctr) are text files encoded using Extensible Markup Language (XML). These files contain the input and output data of CTR Dairy and are kept in the CTR subdirectory. The main menu contains three buttons for these files:

The 'New CTR File' button clears the existing input data from Animal Information, Feed Lists and Schedule tabs. It also clears the existing output data.

The 'Open CTR File' button opens an existing data file with the CTR extension, such as demo.ctr.

The 'Save CTR File' button saves the existing input and output information in a data file with the CTR extension, such as demo.ctr.

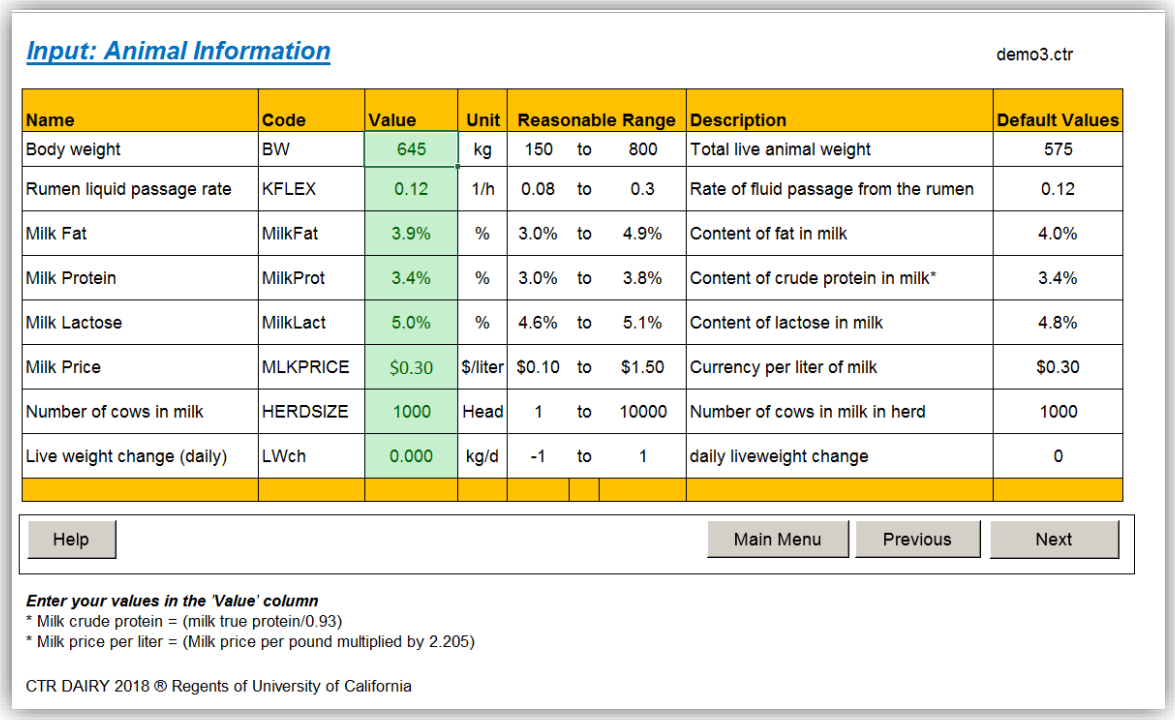
When you exit the program, it automatically saves the current CTR file as LastOne.ctr in the CTR subdirectory. When you start the program, the LastOne.ctr file will be automatically loaded .

MAIN REFERENCE

CTR Dairy is described in Chilibroste et al. (2008; Anim. Feed Sci. Technol. 143: 148173).
http://www.sciencedirect.com/science/article/pii/S0377840107001678

Use the above web address to go to the Elsevier 'Science Direct' Website. Once there, click the 'Check Access' button and login via your institution. If you do not have an institution Username and Password, click the "Register to Purchase" button on the 'Science Direct' website to purchase the article.

ANIMAL INFORMATION



Input: Animal Information demo3.ctr

Name	Code	Value	Unit	Reasonable Range			Description	Default Values
Body weight	BW	645	kg	150	to	800	Total live animal weight	575
Rumen liquid passage rate	KFLEX	0.12	1/h	0.08	to	0.3	Rate of fluid passage from the rumen	0.12
Milk Fat	MilkFat	3.9%	%	3.0%	to	4.9%	Content of fat in milk	4.0%
Milk Protein	MilkProt	3.4%	%	3.0%	to	3.8%	Content of crude protein in milk*	3.4%
Milk Lactose	MilkLact	5.0%	%	4.6%	to	5.1%	Content of lactose in milk	4.8%
Milk Price	MLKPRICE	$0.30	$/liter	$0.10	to	$1.50	Currency per liter of milk	$0.30
Number of cows in milk	HERDSIZE	1000	Head	1	to	10000	Number of cows in milk in herd	1000
Live weight change (daily)	LWch	0.000	kg/d	-1	to	1	daily liveweight change	0

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Enter your values in the 'Value' column
* Milk crude protein = (milk true protein/0.93)
* Milk price per liter = (Milk price per pound multiplied by 2.205)

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In this tab you enter the following about your cows:

BODY WEIGHT

Average live weight of the lactating cows in kilograms. The reasonable range for this value is 150 to 800 kg, and the default value is 575 kg.

RUMEN LIQUID PASSAGE RATE

Rate of liquid passage from the rumen in proportion per hour. The reasonable range is 0.08 to 0.30 per hour, and the default value is 0.12. Do not change the default value unless you have a clear sense of the actual rumen liquid passage rate.

MILK FAT

Level of fat in milk expressed as a percentage. The reasonable range is 3.0 to 4.9%, and the default value is 4.0%.

MILK PROTEIN

Level of crude protein in milk expressed as a percentage. The reasonable range is 3.0 to 3.8%. The default value is 3.4%. To convert the milk true protein to milk crude protein use the equation:

Milk crude protein = (milk true protein/0.93)

MILK LACTOSE

Level of lactose in milk expressed as a percentage. The reasonable range is 4.6 to 5.1%. The default value is 4.8%.

MILK PRICE

Local currency ($ symbol) per litre of milk. To convert milk price per pound to milk price per litre, use the equation:

Milk price/litre = (Milk price/pound * 2.204)

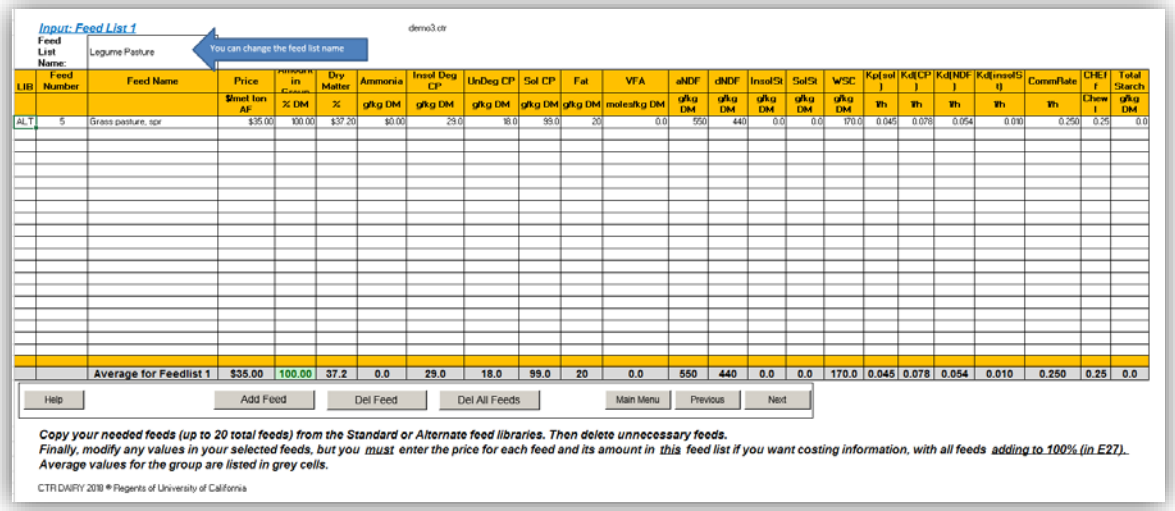
NUMBER OF COWS IN MILK

Number of milking cows in the herd. Ignore dry cows and heifers since CTR Dairy is only for lactating cows.

BODY WEIGHT CHANGE

Live weight change of the lactating cows in kg/day. The reasonable range is 1 to 1 kg/day. The default value is zero (i.e., no change in live weight).

FEEDLISTS



Feeds are divided into three feed lists: Feed list 1 contains pastures, Feed list 2 contains supplemental feeds (i.e., grains, protein meals, byproducts), and Feed list 3 contains supplemental forages (i.e., hays, silages). However any feed can be added to any feed list. You can also change the names of the feed lists.

For each feed list you can add feeds (up to 20 total) from the Standard or Alternate feed libraries. Once a feed is added to a Feed List, you can change any nutritive value in the selected feeds. You must enter the proportion of each feed in the feed list, even if it is 0, with the total of all feeds adding to 100% (in cell E27). You can enter the cost of each feed if you want diet costing information. Nutrient and costing values for the combination of feeds that make up the feed list are in the grey cells below the list of feeds.

All of the 3 feed lists must have at lesat one feed in it, even if you do not later use the feed (i.e., feed list) in the 'Schedule' tab.

Feed descriptors are a combination of analyzable nutrients and rumen kinetics. Many of these values should not be changed unless you are certain that your estimate is more accurate than the default value.

The column headings and descriptions of the feeds in the feed lists are:

FEED NUMBER

A number between 1 to 999.

FEED NAME

A name for the feed up to 20 characters.

PRICE

Price of the feed in any currency (as $ symbol)/tonne of feed on an 'as fed' basis.

AMOUNT

Amount of feed in the Feed List on a percentage 'dry matter' basis.

DRY MATTER (DM)

Dry matter is all nonwater in the feed as a % of the feed.

AMMONIA

Ammonia level of the feed expressed as g/kg DM. Many feeds will have no ammonia, but most ensiled feeds will have some ammonia.

INSOL DEG CP

An estimate of the rumen degraded crude protein (CP) that is not Sol CP expressed as g/kg DM.

UNDEG CP

An estimate of the rumen undegraded crude protein (CP) expressed as g/kg DM.

SOL CP

Rumen soluble crude protein (CP) expressed as g/kg DM.

FAT

Fat expressed as g/kg DM.

VFA

Volatile fatty acids expressed as moles/kg DM. Many feeds will have no VFA, but most ensiled feeds will have some VFA.

ANDF

Neutral detergent fiber (aNDF) determined using a heat stable amylase expressed as g/kg DM.

DNDF

An estimate of rumen degraded aNDF expressed as g/kg DM.

INSOLST

An estimate of rumen insoluble starch expressed as g/kg DM.

SOLST

An estimate of rumen soluble starch expressed as g/kg DM.

WSC

Water soluble carbohydrates expressed as g/kg DM.

KP(SOLIDS)

An estimate of the rumen passage rate of the feed's DM (proportion per hour).

KD(CP)

An estimate of the rumen degradation rate of potentially degradable crude protein (CP) in proportion per hour.

KD(ANDF)

An estimate of the rumen degradation rate of potentially degradable aNDF in proportion per hour.

KD(INSOLST)

An estimate of the rumen degradation rate of rumen insoluble starch in proportion per hour.

COMMRATE

Comminution rate of DM of the feed in proportion per hour. CommRate is the rate that a feed's DM, which is not chewed during ingestion and enters the inert rumen pool unchewed (i.e. is temporarily not digestible), moves to the active rumen pool by ruminative chewing.

CHEFF

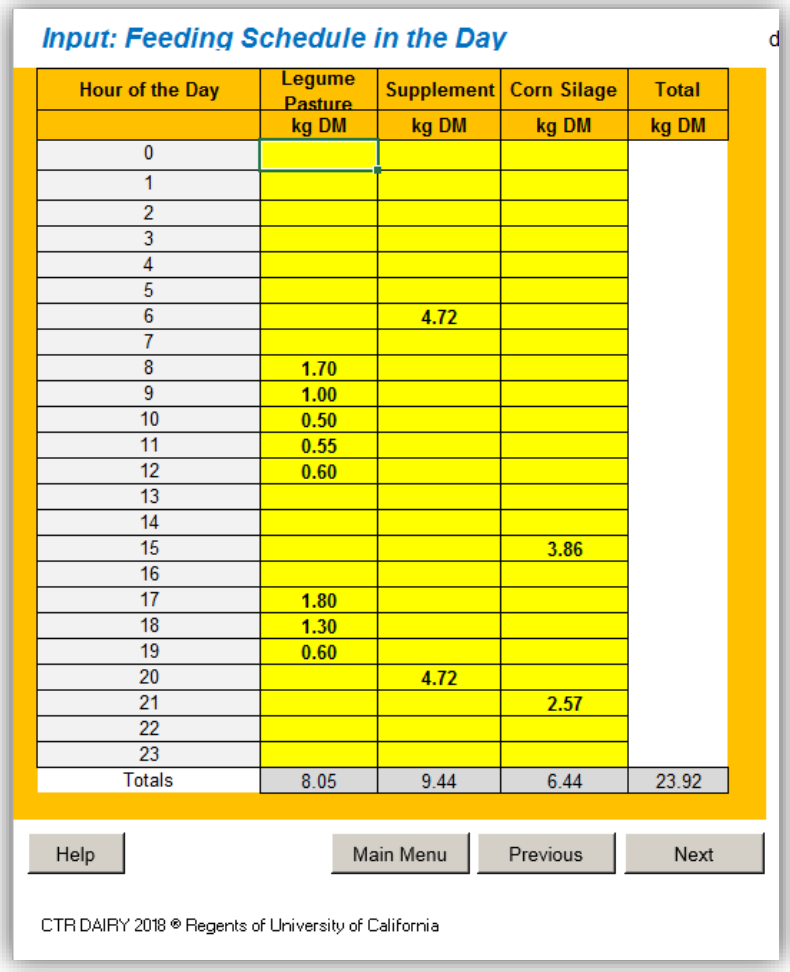
Chewing efficiency of DM in the feed as a proportion of the DM in the feed. CHEff is the proportion of a feed's DM chewed, and damaged, during eating.

STARCH

Total starch in the feed expressed as g/kg DM. Starch should the sum of SolSt and InsolSt.

Click the OK button to close this help message and return to CTR Dairy.

FEEDING SCHEDULE



Input: Feeding Schedule in the Day

Hour of the Day	Legume Pasture	Supplement	Corn Silage	Total
	kg DM	kg DM	kg DM	kg DM
0				
1				
2				
3				
4				
5				
6		4.72		
7				
8	1.70			
9	1.00			
10	0.50			
11	0.55			
12	0.60			
13				
14				
15			3.86	
16				
17	1.80			
18	1.30			
19	0.60			
20		4.72		
21			2.57	
22				
23				
Totals	8.05	9.44	6.44	23.92

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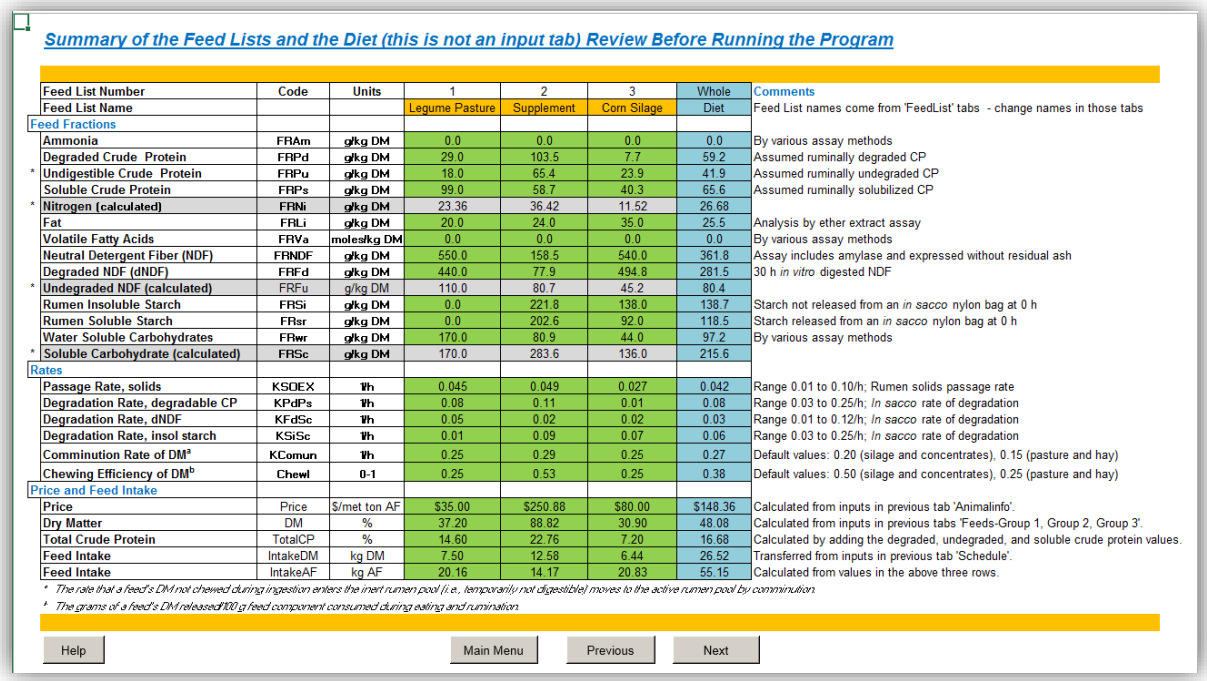
Enter feeds fed in kg DM (by Feed List) in the cells highlighted in yellow (where each cell represents 1 hour of the day). The feeds fed at any hour of the day (i.e., in the yellow cells) are assumed to be eaten over the subsequent 60 minutes. Use of all three 'Feed lists' is not required, but those that you have created can be fed up to 24 times per day in any amount per hour. Feed list names are those that you created in the 'Feed list' tabs.

You can change the feeding schedule and rerun the simulation model to assess the effect of changes in the within day feeding schedule on animal performance and profit projection.

PRERUN SUMMARY



Summary of the Feed Lists and the Diet (this is not an input tab) Review Before Running the Program

	Feed List Number	Code	Units	1	2	3	Whole	Comments
	Feed List Name			Legume Pasture	Supplement	Corn Silage	Diet	Feed List names come from 'FeedList' tabs - change names in those tabs
	Feed Fractions							
	Ammonia	FRAm	g/kg DM	0.0	0.0	0.0	0.0	By various assay methods
	Degraded Crude Protein	FRPd	g/kg DM	29.0	103.5	7.7	59.2	Assumed ruminally degraded CP
*	Undigestible Crude Protein	FRPu	g/kg DM	18.0	65.4	23.9	41.9	Assumed ruminally undegraded CP
	Soluble Crude Protein	FRPs	g/kg DM	99.0	58.7	40.3	65.6	Assumed ruminally solubilized CP
*	Nitrogen (calculated)	FRNi	g/kg DM	23.36	36.42	11.52	26.68	
	Fat	FRLi	g/kg DM	20.0	24.0	35.0	25.5	Analysis by ether extract assay
	Volatile Fatty Acids	FRVa	moles/kg DM	0.0	0.0	0.0	0.0	By various assay methods
	Neutral Detergent Fiber (NDF)	FRNDF	g/kg DM	550.0	158.5	540.0	361.8	Assay includes amylase and expressed without residual ash
	Degraded NDF (dNDF)	FRFd	g/kg DM	440.0	77.9	494.8	281.5	30 h *in vitro* digested NDF
*	Undegraded NDF (calculated)	FRFu	g/kg DM	110.0	80.7	45.2	80.4	
	Rumen Insoluble Starch	FRSi	g/kg DM	0.0	221.8	138.0	138.7	Starch not released from an *in sacco* nylon bag at 0 h
	Rumen Soluble Starch	FRsr	g/kg DM	0.0	202.6	92.0	118.5	Starch released from an *in sacco* nylon bag at 0 h
	Water Soluble Carbohydrates	FRwr	g/kg DM	170.0	80.9	44.0	97.2	By various assay methods
*	Soluble Carbohydrate (calculated)	FRSc	g/kg DM	170.0	283.6	136.0	215.6	
	Rates							
	Passage Rate, solids	KSOEX	1/h	0.045	0.049	0.027	0.042	Range 0.01 to 0.10/h; Rumen solids passage rate
	Degradation Rate, degradable CP	KPdPs	1/h	0.08	0.11	0.01	0.08	Range 0.03 to 0.25/h; *In sacco* rate of degradation
	Degradation Rate, dNDF	KFdSc	1/h	0.05	0.02	0.02	0.03	Range 0.01 to 0.12/h; *In sacco* rate of degradation
	Degradation Rate, insol starch	KSiSc	1/h	0.01	0.09	0.07	0.06	Range 0.03 to 0.25/h; *In sacco* rate of degradation
	Comminution Rate of DM[a]	KComun	1/h	0.25	0.29	0.25	0.27	Default values: 0.20 (silage and concentrates), 0.15 (pasture and hay)
	Chewing Efficiency of DM[b]	Chewl	0-1	0.25	0.53	0.25	0.38	Default values: 0.50 (silage and concentrates), 0.25 (pasture and hay)
	Price and Feed Intake							
	Price	Price	$/met ton AF	$35.00	$250.88	$80.00	$148.36	Calculated from inputs in previous tab 'Animalinfo'.
	Dry Matter	DM	%	37.20	88.82	30.90	48.08	Calculated from inputs in previous tabs 'Feeds-Group 1, Group 2, Group 3'.
	Total Crude Protein	TotalCP	%	14.60	22.76	7.20	16.68	Calculated by adding the degraded, undegraded, and soluble crude protein values.
	Feed Intake	IntakeDM	kg DM	7.50	12.58	6.44	26.52	Transferred from inputs in previous tab 'Schedule'.
	Feed Intake	IntakeAF	kg AF	20.16	14.17	20.83	55.15	Calculated from values in the above three rows.

* *The rate that a feed's DM not chewed during ingestion enters the inert rumen pool (i.e., temporarily not digestible) moves to the active rumen pool by comminution*

[a] *The grams of a feed's DM released/100 g feed component consumed during eating and rumination*

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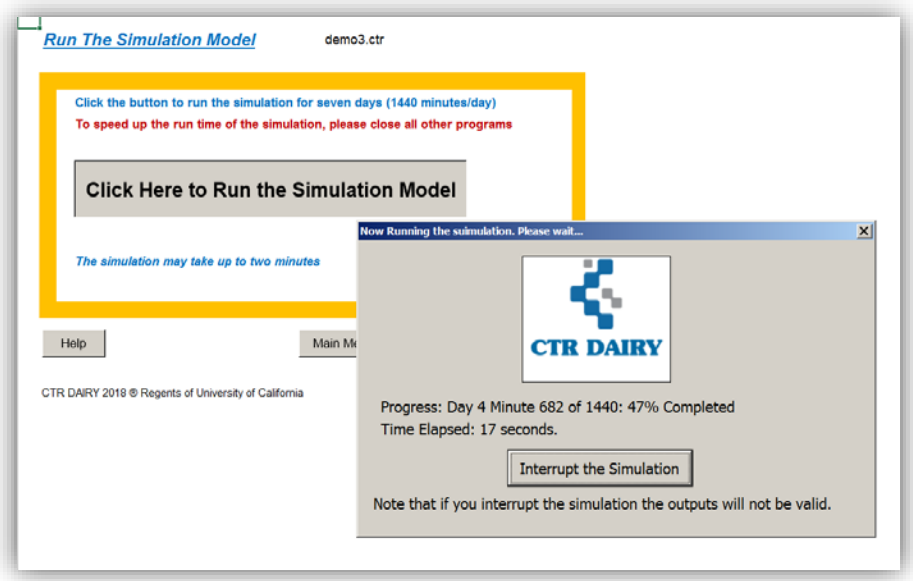
This is not an input tab, but a recap of all your inputs. It shows the feed fractions, kinetic rates and pricing of each Feed list, as well as summarized values for the diet. It also shows total feed intakes by feed list as defined by you in the schedule tab. Review these values to be sure that they are biologically reasonable before running the simulation model.

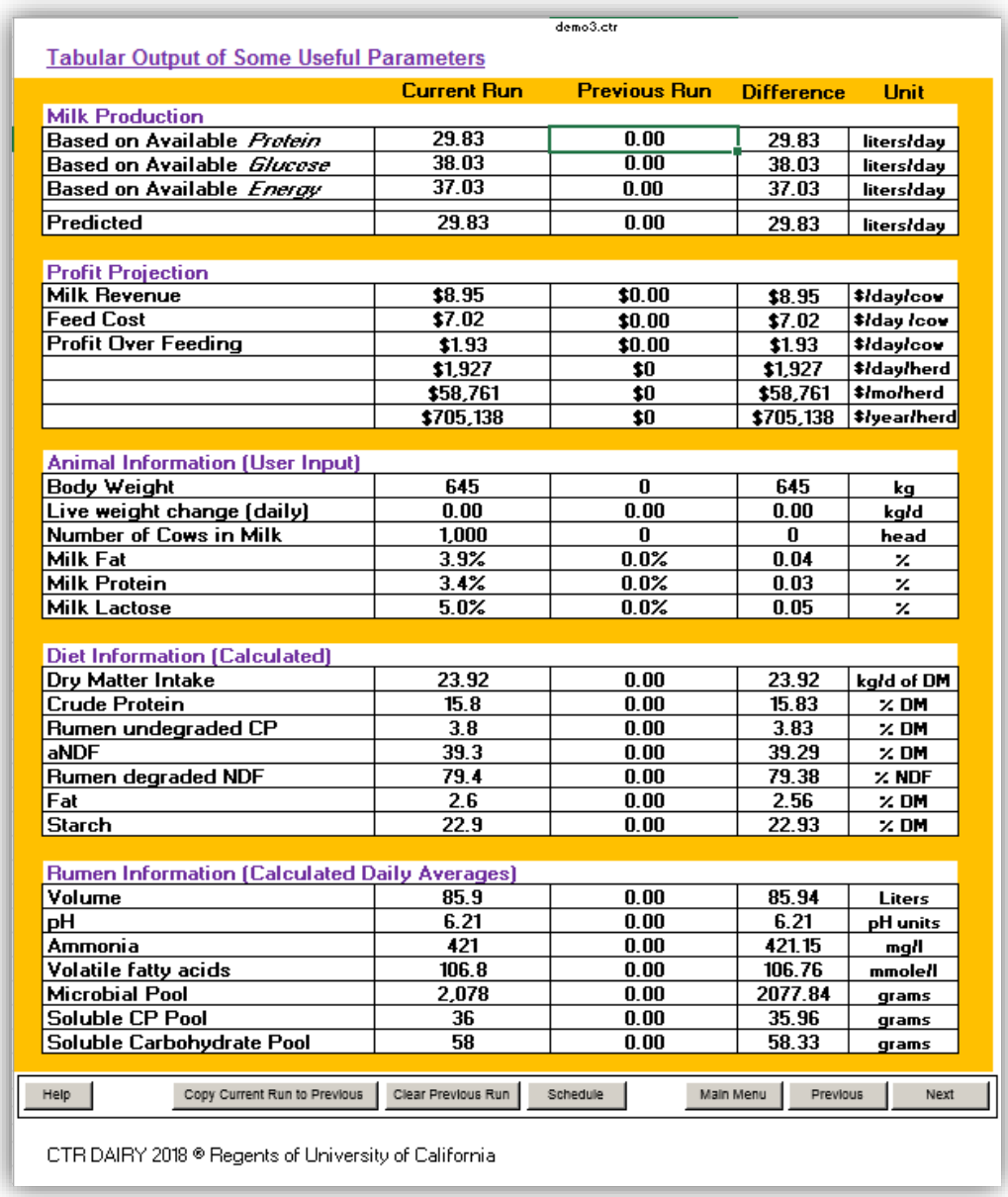
RUN



Click the large gray button to run the simulation model. CTR Dairy will then run a dynamic simulation of rumen fermentation, digestion and absorption of nutrients as well as animal outputs by minute for 7 days.

The simulation can take up to two minutes. You can interrupt it at any time by pressing the 'Interrupt Simulation' button in the 'Progress' popup window, but the results of the simulation will not be accurate.

TABULAR OUTPUT



demo3.ctr

Tabular Output of Some Useful Parameters

	Current Run	Previous Run	Difference	Unit
Milk Production				
Based on Available *Protein*	29.83	0.00	29.83	liters/day
Based on Available *Glucose*	38.03	0.00	38.03	liters/day
Based on Available *Energy*	37.03	0.00	37.03	liters/day
Predicted	29.83	0.00	29.83	liters/day
Profit Projection				
Milk Revenue	$8.95	$0.00	$8.95	$/day/cow
Feed Cost	$7.02	$0.00	$7.02	$/day /cow
Profit Over Feeding	$1.93	$0.00	$1.93	$/day/cow
	$1,927	$0	$1,927	$/day/herd
	$58,761	$0	$58,761	$/mo/herd
	$705,138	$0	$705,138	$/year/herd
Animal Information (User Input)				
Body Weight	645	0	645	kg
Live weight change (daily)	0.00	0.00	0.00	kg/d
Number of Cows in Milk	1,000	0	0	head
Milk Fat	3.9%	0.0%	0.04	%
Milk Protein	3.4%	0.0%	0.03	%
Milk Lactose	5.0%	0.0%	0.05	%
Diet Information (Calculated)				
Dry Matter Intake	23.92	0.00	23.92	kg/d of DM
Crude Protein	15.8	0.00	15.83	% DM
Rumen undegraded CP	3.8	0.00	3.83	% DM
aNDF	39.3	0.00	39.29	% DM
Rumen degraded NDF	79.4	0.00	79.38	% NDF
Fat	2.6	0.00	2.56	% DM
Starch	22.9	0.00	22.93	% DM
Rumen Information (Calculated Daily Averages)				
Volume	85.9	0.00	85.94	Liters
pH	6.21	0.00	6.21	pH units
Ammonia	421	0.00	421.15	mg/l
Volatile fatty acids	106.8	0.00	106.76	mmole/l
Microbial Pool	2,078	0.00	2077.84	grams
Soluble CP Pool	36	0.00	35.96	grams
Soluble Carbohydrate Pool	58	0.00	58.33	grams

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This tab shows the predicted milk production, profit projection and other key outputs. Use the Copy button to copy values from the 'Current Run' column onto the 'Previous Run' column before rerunning the program. This will allow you to easily assess effects of your modified feeding schedule and/or other inputs on predicted milk production and profit projection.

MILK PRODUCTION

CTR Dairy predicts potential milk productions based upon available protein, glucose and energy separately, and then selects the lowest value of available protein or energy as the 'predicted' production because predictions based upon protein and energy account for body weight change, whereas that based upon glucose does not.

PROFIT PROJECTION

All profits are projected milk revenue (i.e., predicted milk production * milk price) minus feed costs, based upon your inputs.

ANIMAL INFORMATION

These are summaries of your inputs on the 'Animal Information' tab.

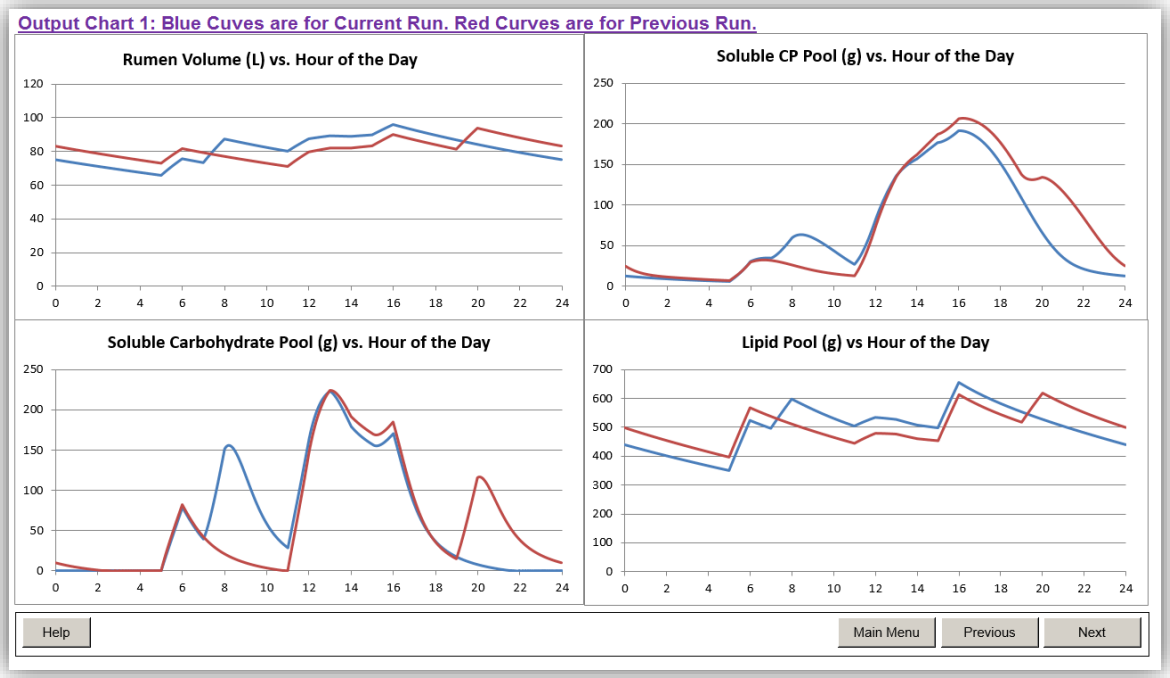
DIET INFORMATION

These are summaries of your inputs in the Feed Lists and 'Feeding Schedule' tab.

RUMEN INFORMATION

Summarizes daily averages of key parameters calculated by the simulation model. The diurnal patterns of some of these parameters are shown in the Figures.

CHART1 OUTPUT



This tab shows four charts which illustrate the diurnal patterns of four selected rumen parameters that reflect rumen fermentation.

The charts are:

1. RUMEN VOLUME (L) VS. HOUR OF THE DAY

Rumen volume is all the fluid in the rumen that is free or intracellular (i.e., still in the feeds consumed). This plot is shown to illustrate changes in rumen volume during a day and is important since, combined with the kinetic rates of degradation and passage, predicts the amount of the diet nutrients which escape the rumen undegraded on a continuous basis, as well as the concentrations of many important metabolites.

2. SOLUBLE CP POOL (G) VS. HOUR OF THE DAY

Soluble CP represents protein available to support microbial growth. This pool is important since rumen soluble CP pool sizes that are too low could negatively effect rumen microbial growth and, if this occurs, then fermentation in the rumen will be reduced and feed intake will decline. A critical lower level appears to be in the 25 to 35 g range.

3. SOLUBLE CARBOHYDRATE POOL (G) VS. HOUR OF THE DAY

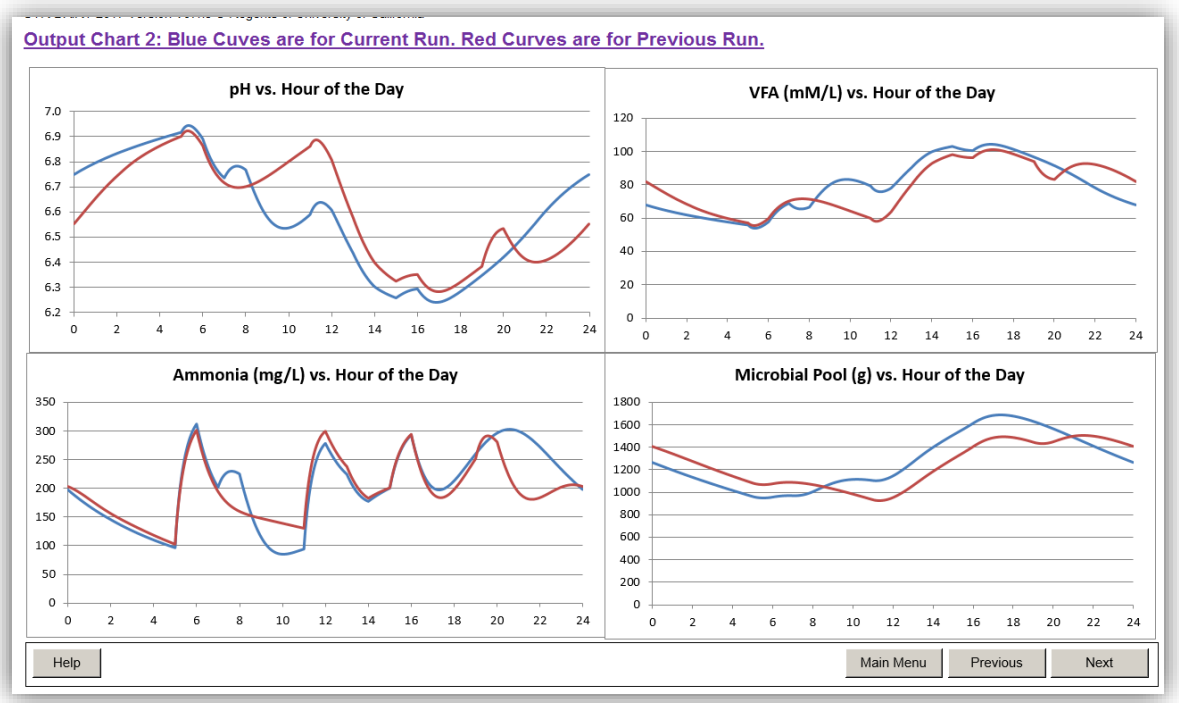
Soluble carbohydrate is carbohydrate available to support microbial growth. This pool is important since rumen soluble carbohydrate pool sizes that are too low, or too high, could negatively effect rumen microbial growth and, if this occurs, then fermentation in the rumen will be reduced and feed intake will decline. A critical lower level to provide sufficient available carbohydrate is in the 40 to 60 g range, while a critical upper level to prevent rumen

acidosis (i.e., excess acid accumulation which causes cows to reduce diet intake and production) is greater than 500 g.

4. LIPID POOL (G) VS. HOUR OF THE DAY

Lipid is fat in the rumen that is from the diet. Free unsaturated fats in the rumen from the diet can be important because it represents a sink for excess hydrogen, but high levels could interfere with rumen fermentation thereby suppressing diet intake. There is no suggested minimum lipid pool size, and excessively high pool sizes will depend on the types of fat in the diet and the microbial pool size.

CHART 2 OUTPUT



This tab shows four charts which illustrate the diurnal patterns of four selected rumen parameters that reflect rumen fermentation.

The charts are:

1. PH VS. HOUR OF THE DAY

pH is a measure of the acidity of rumen fluid. This is important because microbial growth is negatively impacted, to varying extents by microbial species, as rumen pH declines. pH values below ~5.8 are indicative of a sufficiently high acid load in the rumen to have a measurable negative impact on rumen fermentation. Thus the greater the time in the day that rumen pH values are lower than ~5.8, the greater are these negative impacts.

2. VFA (MM/L) VS. HOUR OF THE DAY

VFA is the sum of all VFA that are in the rumen. These are primarily acetic, propionic, butyric and some branched chain VFA. VFA are very important since they are the end products of metabolism of most bacteria in the rumen, and are usually directly related to rumen pH (as VFA concentrations increase, pH tends to decrease). However VFA are also very important because they are alsorbed from the rumen and are precursers of glucose and fatty acids major energy sources to support milk production synthesized during animal metabolism. Values below 80 are suggestive of poor rumen fermentation, whereas values over 140 are suggestive of excessive levels of fermentable carbohydrate in the diet.

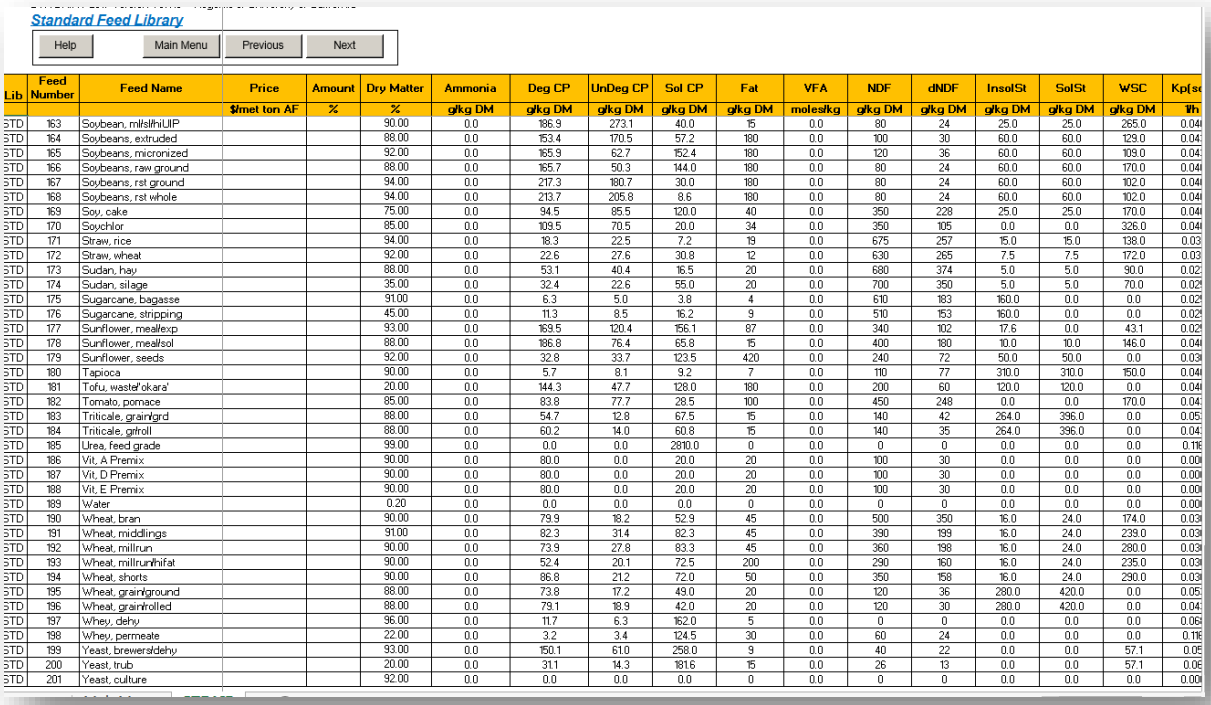
3. AMMONIA (MG/L) VS. HOUR OF THE DAY

Ammonia is the concentration of ammonia in rumen fluid. Ammonia is important because it is a major nitrogenous endproduct of metabolism by rumen proteolytic bacteria (i.e., bacteria that ferment proteins). It is also a major source of nitrogen for growth of most rumen cellulolytic bacteria (i.e., bacteria that ferment structural fibers). Levels less than ~80 mg/liter are indicative of insufficient ammonia availability, and levels >350 mg/liter will likely suppress activity of proteolytic bacteria, as well as being associated with inefficient use of diet nitrogen.

4. MICROBIAL POOL (G) VS. HOUR OF THE DAY

The microbial pool is the sum of all of the bacterial and protozoal biomass in the rumen. The size of the rumen microbial pool is indicative of the fermentative capacity of the animal's rumen. In general, higher rumen pool sizes are better, but perhaps most important is rumen pool sizes that have very little diurnal fluctuation which is reflective of a consistently fed rumen microbial population and so high efficiency of use of the diet.

STANDARD FEED LIBRARY



Standard Feed Library

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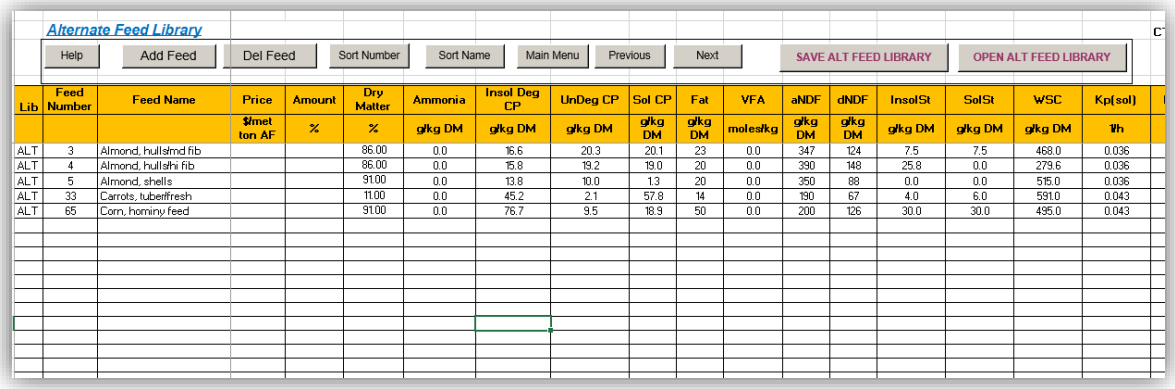
Lib	Feed Number	Feed Name	Price	Amount	Dry Matter	Ammonia	Deg CP	UnDeg CP	Sol CP	Fat	VFA	NDF	dNDF	InsolSt	SolSt	WSC	Kp(s
			$/met ton AF	%	%	g/kg DM	g/kg DM	g/kg DM	g/kg DM	g/kg DM	moles/kg	g/kg DM	g/kg DM	g/kg DM	g/kg DM	g/kg DM	1/h
STD	163	Soybean, mlt/sl/hi,UIP			90.00	0.0	186.9	273.1	40.0	15	0.0	80	24	25.0	25.0	265.0	0.04
STD	164	Soybeans, extruded			88.00	0.0	153.4	170.5	57.2	180	0.0	100	30	60.0	60.0	129.0	0.04
STD	165	Soybeans, micronized			92.00	0.0	165.9	62.7	152.4	180	0.0	120	36	60.0	60.0	109.0	0.04
STD	166	Soybeans, raw ground			88.00	0.0	165.7	50.3	144.0	180	0.0	80	24	60.0	60.0	170.0	0.04
STD	167	Soybeans, rst ground			94.00	0.0	217.3	180.7	30.0	180	0.0	80	24	60.0	60.0	102.0	0.04
STD	168	Soybeans, rst whole			94.00	0.0	213.7	205.8	8.6	180	0.0	80	24	60.0	60.0	102.0	0.04
STD	169	Soy, cake			75.00	0.0	94.5	85.5	120.0	40	0.0	350	228	25.0	25.0	170.0	0.04
STD	170	Soychlor			85.00	0.0	109.5	70.5	20.0	34	0.0	350	105	0.0	0.0	326.0	0.04
STD	171	Straw, rice			94.00	0.0	18.3	22.5	7.2	19	0.0	675	257	15.0	15.0	138.0	0.03
STD	172	Straw, wheat			92.00	0.0	22.6	27.6	30.8	12	0.0	630	265	7.5	7.5	172.0	0.03
STD	173	Sudan, hay			88.00	0.0	53.1	40.4	16.5	20	0.0	680	374	5.0	5.0	90.0	0.02
STD	174	Sudan, silage			35.00	0.0	32.4	22.6	55.0	20	0.0	700	350	5.0	5.0	70.0	0.02
STD	175	Sugarcane, bagasse			91.00	0.0	6.3	5.0	3.8	4	0.0	610	183	160.0	0.0	0.0	0.02
STD	176	Sugarcane, stripping			45.00	0.0	11.3	8.5	16.2	9	0.0	510	153	160.0	0.0	0.0	0.02
STD	177	Sunflower, mealfexp			93.00	0.0	169.5	120.4	156.1	87	0.0	340	102	17.6	0.0	43.1	0.02
STD	178	Sunflower, meal/sol			88.00	0.0	186.8	76.4	65.8	15	0.0	400	180	10.0	10.0	146.0	0.04
STD	179	Sunflower, seeds			92.00	0.0	32.8	33.7	123.5	420	0.0	240	72	50.0	50.0	0.0	0.03
STD	180	Tapioca			90.00	0.0	5.7	8.1	9.2	7	0.0	110	77	310.0	310.0	150.0	0.04
STD	181	Tofu, waste/'okara'			20.00	0.0	144.3	47.7	128.0	180	0.0	200	60	120.0	120.0	0.0	0.04
STD	182	Tomato, pomace			85.00	0.0	83.8	77.7	28.5	100	0.0	450	248	0.0	0.0	170.0	0.04
STD	183	Triticale, grain/grd			88.00	0.0	54.7	12.8	67.5	15	0.0	140	42	264.0	396.0	0.0	0.05
STD	184	Triticale, grl/roll			88.00	0.0	60.2	14.0	60.8	15	0.0	140	35	264.0	396.0	0.0	0.04
STD	185	Urea, feed grade			99.00	0.0	0.0	0.0	2810.0	0	0.0	0	0	0.0	0.0	0.0	0.11
STD	186	Vit, A Premix			90.00	0.0	80.0	0.0	20.0	20	0.0	100	30	0.0	0.0	0.0	0.00
STD	187	Vit, D Premix			90.00	0.0	80.0	0.0	20.0	20	0.0	100	30	0.0	0.0	0.0	0.00
STD	188	Vit, E Premix			90.00	0.0	80.0	0.0	20.0	20	0.0	100	30	0.0	0.0	0.0	0.00
STD	189	Water			0.20	0.0	0.0	0.0	0.0	0	0.0	0	0	0.0	0.0	0.0	0.00
STD	190	Wheat, bran			90.00	0.0	79.9	18.2	52.9	45	0.0	500	350	16.0	24.0	174.0	0.03
STD	191	Wheat, middlings			91.00	0.0	82.3	31.4	82.3	45	0.0	390	199	16.0	24.0	239.0	0.03
STD	192	Wheat, millrun			90.00	0.0	73.9	27.8	83.3	45	0.0	360	198	16.0	24.0	280.0	0.03
STD	193	Wheat, millrun/hifat			90.00	0.0	52.4	20.1	72.5	200	0.0	290	160	16.0	24.0	235.0	0.03
STD	194	Wheat, shorts			90.00	0.0	86.8	21.2	72.0	50	0.0	350	158	16.0	24.0	290.0	0.03
STD	195	Wheat, grain/ground			88.00	0.0	73.8	17.2	49.0	20	0.0	120	36	280.0	420.0	0.0	0.05
STD	196	Wheat, grain/rolled			88.00	0.0	79.1	18.9	42.0	20	0.0	120	30	280.0	420.0	0.0	0.04
STD	197	Whey, dehy			96.00	0.0	11.7	6.3	162.0	5	0.0	0	0	0.0	0.0	0.0	0.06
STD	198	Whey, permeate			22.00	0.0	3.2	3.4	124.5	30	0.0	60	24	0.0	0.0	0.0	0.11
STD	199	Yeast, brewers/dehy			93.00	0.0	150.1	61.0	258.0	9	0.0	40	22	0.0	0.0	57.1	0.05
STD	200	Yeast, trub			20.00	0.0	31.1	14.3	181.6	15	0.0	26	13	0.0	0.0	57.1	0.06
STD	201	Yeast, culture			92.00	0.0	0.0	0.0	0.0	0	0.0	0	0	0.0	0.0	0.0	0.00

This tab shows all feeds (201) in the Standard Feed Library. The descriptors of all of these feeds are protected (i.e., read only) and you cannot modify them here. However you you can copy these feeds into the Alternate Feed Library and modify their descriptor values there if desired. Creation of the Alternate Feed Library allows you to customize feeds (and their composition) for your geographical area.

While the main use of the Standard Feed Library is to build your Alternate Feed Library, its feeds can also be used directly to create your Feed lists in any simulation.

ALTERNATE FEED LIBRARY



Alternate Feed Library

Help | Add Feed | Del Feed | Sort Number | Sort Name | Main Menu | Previous | Next | SAVE ALT FEED LIBRARY | OPEN ALT FEED LIBRARY

Lib	Feed Number	Feed Name	Price	Amount	Dry Matter	Ammonia	Insol Deg CP	UnDeg CP	Sol CP	Fat	VFA	aNDF	dNDF	InsolSt	SolSt	WSC	Kp(sol)
			$/met ton AF	%	%	g/kg DM	g/kg DM	g/kg DM	g/kg DM	g/kg DM	moles/kg	g/kg DM	g/kg DM	g/kg DM	g/kg DM	g/kg DM	1/h
ALT	3	Almond, hulls/md fib			86.00	0.0	16.6	20.3	20.1	23	0.0	347	124	7.5	7.5	468.0	0.036
ALT	4	Almond, hulls/hi fib			86.00	0.0	15.8	19.2	19.0	20	0.0	390	148	25.8	0.0	279.6	0.036
ALT	5	Almond, shells			91.00	0.0	13.8	10.0	1.3	20	0.0	350	88	0.0	0.0	515.0	0.036
ALT	33	Carrots, tuber/fresh			11.00	0.0	45.2	2.1	57.8	14	0.0	190	67	4.0	6.0	591.0	0.043
ALT	65	Corn, hominy feed			91.00	0.0	76.7	9.5	18.9	50	0.0	200	126	30.0	30.0	495.0	0.043

This tab shows the Alternate Feed Library. You can copy one or more feeds from the Standard Feed Library into it and then change their descriptive values here. The maximum number of feeds in the Alternate Feed Library is 100. Once any feed is copied into the Alternate Feed Library you can rename and renumber it. Any feed in the Standard Feed Library can be copied into the Alternate Feed Library more than once and renamed to create multiple feeds with similar descriptors.

The main use of the Alternate Feed Library is to create a listing of your commonly used feeds, which facilitates rapid creation of Feed Lists in any simulation.

Click the 'Add Feed' button to add feeds from the Standard library. Click the 'Del Feed' button to delete a feed. Click the 'Sort Number' button to sort on feed numbers. Click the 'Sort Name' to sort on feed names.

There should not be any blank rows between feeds in the Alternate Feed Library. If this occurs, then when you want add one these feeds to any of your feed lists, you will get a partial list of feeds from the Alternate Feed Library. That is, the dropdown list will stop at the first blank row.

Warning ***If you modify the Alternate feed library, you must click on the 'SAVE ALT FEED LIBRAY' to save it as CtrAltLib.dbf in the Lib subdirectory of the ctrDairy2018 folder; otherwise the changes you have made to this library will be lost. The program automatically reads the CtrAltLib.dbf file when the program starts. You can do the same by clicking on the 'OPEN ALT FEED LIBRAY' button.***