# **Spartan Dairy 3 Tutorial**

## Evaluating an existing ration and rebalancing it

In this exercise, we will open an existing ration, alter the animal description, edit feeds, and rebalance to meet the new requirements.

## 1. Opening a Ration File

When you start Spartan Dairy 3, the main application window will open. To open an existing ration file, you can press the file folder button D, press Ctrl-O, or use the main menu to select **File > Open Ration**.



For this tutorial, let's use the sample lactating cow ration.

This screenshot shows the open file dialog for Windows XP. It will look a little different for Windows 7 and Vista.



### 2. Modifying an Animal Description

Click on the hot button or use the menu choose animal description. In this example, are working with a lactating cow, so the "Describe the Target Lactating Cow" dialog opens.

scribe t	he Target	Lactating	Cow		Describe	the Target	Lactatin	g Cow	
Current Cow stage Lactation Days in mi Total body Mature bo	Information Mid lactation humber: k: weight: dy weight:	on cow2 2 120 1415. 1499	<ul> <li>days</li> <li>lb</li> </ul>	Cancel	Currer Cow sta Lactatio Days in Total bo Mature b	et Information ge: Mid lactati n number: milk: dy weight: boody weight:	on cow2 100 1500 1600	days     days     do     lb	Cancel
Product	<mark>ion Informa</mark> Milk yield Ib/day	tion Fat %	TProtein %	Lactose %	- Produ	<mark>ction Informa</mark> Milk yield Ib/day	tion Fat %	TProtein %	Lactose %
Target:	88.2	3.50	3.30	4.85	Target:	95.0	3.60	3.20	4.85
Actual:	0.0	3.50	3.30	4.85	Actual:	93.0	3.60	3.20	4.85
Farm's milk	price:	0.00	C \$/lb	€ \$/100 lb	Farm's m	nilk price:	16.20	C \$/lb	€ \$/100 lb
Actual DM	I per cow:	0.00	lb/day		Actual D	MI per cow:	57.00	lb/day	
Predicti	ons from Ta	rget Anim	al		Predic	tions from Ta	arget Anin	al	
Predicted	base DMI:	56.65 I	b/day		Predicte	d base DMI:	60.29	lb/day	
Predicted	adjusted DMI	55.61 I	b/day		Predicte	d adjusted DMI	: 58.38	lb/day	
Predicted	daily gain:	1.28 I	b/day		Predicte	d daily gain:	1.40	lb/day	
Required [	NEL density:	0.75 M	//iD		Require	d NEL density:	0.77	Mcal/Ib	

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Dairy

Feeds Animal Ration Reports Settings

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In this example, we first drop days in milk to 100, then increase mature BW to 1600, increase total body weight to 1500 lb, increase target milk yield to 95 lb, change fat to 3.60%, change protein to 3.2%, and insert values for actual milk, fat, protein, farm milk price and actual intake.

NOTE: Whenever you change total body weight, we suggest you first adjust mature body weight. Mature BW is on a body condition 3 basis (See <u>Understanding animal weights</u> at the end of Chapter 8). Thus, mature BW should never be less than total BW, unless the animal is currently fat. Then, the loss of body condition would decrease total BW while keeping BC3-adjusted body weight constant. In Spartan 3, we assume body frame can never be lost, so BC3 adjusted BW can never decrease. Thus, whenever you want to change BW, you should change Mature body weight, and the program will recalculate the current total BW based on days in milk. In this example, when we change mature BW

to 1600 lb for a cow at 100 DIM, we get a current total BW 1505 lb. We then dropped that to 1500.

Next we will edit the BW gain of the cow so that she is not gaining body condition. Choose **Animal > Gain and Pregnancy** in the Ration menu.



This brings up the Set Body Weig Parameters dialog.	tht Gain	t Daily Bod	y Weigh ormation	ıt Gain Pa	rameter	5		
You should check here that the cupregnant BC3-adjusted BW is not than the mature BW.	rrent non- more	Total body we Body condition Days pregnan Body weight v	ight: n score: t: vithout fetu	IS:	1500.0 3.00 🚖 0 1500.0	Ь	Cancel	
In this example, our cow must add frame growth in the next 280 days will change the target Body Cond	d 100 lb s. But we ition	Non-pregnant Mature body Daily Pregn	BC3 body weight: ancy Gai	in	1500.0 1600.0 <b>0.00</b>	lb kg <b>Ib/day</b>		of
Score to 3.0 so that she simply maintains current BCS. Thus, she has not target BC gain, but still has a target frame gain of 0.36 lb/day.		Target Fran Non-pregnant Days to achie Target frame g Target Daily	ne Grow BC3 body ve frame <u>c</u> growth: <b>v Frame (</b>	th owt:   growth:   Growth:	1600.0 280 100.00 <b>0.36</b>	lb days lb <b>lb/day</b>		her
Press And notice that the essential elements of the cow described by the top of the worksheet Dairy Ration: Sample Lactating	te cription t window.	Target Bod Target body c Days to achie Target body c Target Daily Target Daily MPD:95.0.1	y Condit ondition so ve body co ondition g b BC Gai BC Gai	ion Gain - core: ondition: ain: n: /t. Gain:	300 € 100 0.00 0.36 0.36	days Ib Ib/day Ib/day	-57.4 b	are
MIX Feed name	Amount DM Ib	As Fed	DM %	Group Asl	Fed %	Diet DMI	EfNDF %DM	

The target for this ration is 1 Holstein Lactating cow in her 2<sup>nd</sup> lactation with a body weight of 1500 lb. She is 100 Days in Milk and is producing 95 lb/day of milk that 3.6% fat. She is gaining 0.36 lb/day and is eating 57.4 lb DM/day. Note these are the values for the targets, not the actual milk and DMI.

Next we will modify feed characteristics.

3. **Modifying Feed Characteristics.** We will now add a new feed and then change its nutrient content.

Use the worksheet menu to Add Feeds, or press Ctrl+F, click the **F** hot button.

File	Feeds	Animal	Ration	Reports	Settings	Ţ		
	Cut			Ctrl+X				
-	Cop	ργ		Ctrl+C				
5	Pas	te		Ctrl+V				
Nev	Sele	ect All		Ctrl+A				
Π	📕 Ada	d Feeds		Ctrl+F				
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First a dialog will appear for you to select the source library or ration. You can add a feed from a library file or another ration. In this case, we will choose the Master Feed Library. Next the Add

Feeds dialog will appear. In example, we want to add cottonseeds. Because the Master Library has many feeds, the easiest way to do is to type "cot" in the **Feed** name box. Three feeds show double click "Cotton seed. whole with lint" or click it and use the **Add Selected** button. Once it appears on Feeds to Add to Active File press the Okay button.

clicking once.

it is the active row.

this Add Feeds Source File: C:\Documents and Settings\MikeVH adminstrator\My Documents\Spartan Dairy 3\Master Feed Library 🗸 ок View Feeds in Source File Matching These Criteria Feed name: cot Test dates: View all test dates -🗙 Cancel Feed type: Start date: 11/9/2009 -View common feeds only this Matching Feeds in Source File Feeds to Add to Active File Test DM CP NDF A Test Date DM CP NDF % %DM %DM Feed name Feedname Cotton seed hulls 
 Cotton seed hulls
 11/09/09
 89.0
 6.2
 85.0

 Cotton seed meal, solvent,
 11/09/09
 90.5
 44.9
 30.8
 Cotton seed, whole with lint 11/09/09 90.1 23.5 50.3 up; Add Selected Cotton seed, whole with lin! 11/09/09 90.1 23.5 50.3 Add ALL once Remove Selected the grid, Remove ALL Corn grain, ground, dry Next let's delete the two fat sources. Select "Fat-Partially Fat - Partially hydrogenated tallo Fat - Vegetable oil hydrogenated tallow" by placing the cursor to the left of the row and Corn grain, ground, dry Fat - Partially hydrogenated tallo Fat - Vegetable oil To select both feeds, move the cursor to the left of the "Fat – Vegetable oil" row and now click while pressing the **Crtl** key. Corn grain, ground, dry indicates a selected feed and *i* indicates that a feed is selected Fat - Partially hydrogenated tallow and Fat - Vegetable oil

Now delete the two selected feeds by using the worksheet menu to choose **Delete Feeds** or use Ctrl+Del.

The last thing we will do before evaluating and rebalancing the diet is to change the CP concentration of the legume silage to 19%.

Go to the protein tab, select the CP cell for legume silage and write in the new value of 19.0. Once you press Enter or Tab or click on another cell, the change is done and cannot be undone.

	B Dairy Ration: Sample Lactating Cow Ration.MDB									
N	New diet: 1 Holstein, Lactating cow, Lac:2, Wt:1500 lb, DIM:100, MPD:95.0 lb, MFa									
	міх	Feed name	Amount DM Ib	CP %DM	RUP %CP					
		Wheat straw	0.00	4.8	7					
		Corn silage, normal 32-38% DM	19.84	94.0	3					
Þ	•	Legume Silage, 40% NDF	7.94	19.0	1					
14		Legume Silage, 40% NDF	7.94	19.0						

We are now ready to evaluate the diet and rebalance. Check out the totals for each column, and you should note that the cow can eat a little more feed, but that the diet is reasonably close to meeting requirements for fiber, energy, protein, and minerals.

Feeds Animal Ration Reports Settings Tabs Window Help Cut Ctrl+X MBISIO Ctrl+C Сору

Paste Select All

F Add Feeds...

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Dairy Ration: Sample Lactatin

New diet: 1 Holstein, Lactating cow, Lac:2, V

Wheat straw

Feed name

Corn silage, normal 32-38% DM

Corn distillers grains w/ solubles, d. Cotton seed, whole with lin

Fat - Partially hydrogenated tallow Fat · Vegetable oil

Soybean meal, solvent, 48% CP

Legume Silage, 40% NDF

Corn grain, ground, dry

S I New	Dairy Ration: Sample Lactating diet: 1 Holstein, Lactating cow, Lac:2, V	<mark>g Cow Ration</mark> Vt:1500 lb, DIM:100,	MPD:95.	0 lb, MFat:	3.6%, DI	G:0.36 lb/d	ay, DMI:57.4	4 lb							
м	X Feed name	Amount DM Ib	DM %	%Diet %DMI	NDF %DM	EfNDF %DM	NEL Mcal/lb	CP %DM	RUP dig %RUP	Cost DM \$/lb	FA %DM	Ca %DM		Nutrient Bala	nce
	Wheat straw	0.00	92.7	0.00	73.0	73.0	0.39	4.8	65	0.022	0.6	0.31			-DMI
Þ	Corn silage, normal 32-38% DM	19.84	35.1	35.60	45.0	45.0	0.65	8.8	70	0.034	2.2	0.28			
	Legume Silage, 40% NDF	7.94	42.1	14.25	40.0	40.0	0.57	22.6	68	0.048	1.3	1.38			-NDF
	Cotton seed, whole with lint	0.00	90.1	0.00	50.3	25.2	0.83	23.5	80	0.089	18.3	0.17			010-01-00
	Corn distillers grains w/ solubles, d	0.00	90.2	0.00	38.8	9.7	0.83	29.7	80	0.055	9.0	0.22			-EfNDF
	Corn grain, ground, dry	20.06	88.1	36.00	9.5	2.4	0.89	9.4	90	0.062	3.2	0.04			NE
_	Soybean meal, solvent, 48% CP	4.41	89.5	7.91	9.8	2.5	0.92	53.8	93	0.112	0.1	0.35		1 <b>F</b> 1	
	Soybean meal, expellers, 45%CP	2.20	89.6	3.96	21.7	5.4	0.92	47.0	93	0.123	3.0	0.36			-CP
1	Salt-white	0.00	99.0	0.00	0.0	0.0	0.00	0.0	0	0.061	0.0	0.00			
	Dicalcium phosphate Ca 23% : P	0.00	97.0	0.00	0.0	0.0	0.00	0.0	0	0.208	0.0	23.00			-MP
_	MinVit mix (1.5%) - complete LoCa	0.84	98.0	1.50	3.0	0.0	0.00	0.0	0	0.226	0.0	13.50		111	1000 1000
	Limestone	0.44	99.0	0.79	0.0	0.0	0.00	0.0	0	0.071	0.0	36.00			-RDP
-															Co
	Concentration supplied	55.73	52.2	100.00	26.8	23.0	0.74	15.9	85.9	0.059	2.2	0.84			-Ca
<	8											>			-P
1		Amount DM Ib/day	DM %	%Diet %DMI	NDF Ib/day	EfNDF Ib/day	NEL Mcal/day	CP Ib/day	RUP dig Ib/day	Cost DM \$/day	FA Ib/day	Ca g/day	F g/c		-Se
	Supply	55.73	52.2	100.0	14.9	12.8	41.4	8.83	3.01	3.29	1.25	212.44	5		1.02.0
	Requirements	57.42			16.1	12.9	42.5	9.46	3.18			209.97	1(		-vπ A
	Difference	-1.68			-1.1	-0.1	-1.1	-0.63	-0.17			2.47		10 0 10	
Hom	e Fiber Energy Protein Carboh	ydrate Lipid Min	neral Tr	ace Min.	Vitamin	Amino Ac	id Cost	Misc.						+/-% of reqt.	
															/

#### 4. Adjusting Feed Amounts

Change the amounts of feeds to rebalance the diet using 3 lb of cottonseeds and feed a total of 57.4 lb instead of 55.7 lb. Simply, write new values over the old ones. You can change amounts of feeds using the Group AsFed column, AsFed column, Amount DM column, or %Diet column. Usually we use the Amount DM column.

#### 5. Manually Balancing the Ration

First add in the 3 lb cottonseed, and you can see there is too much total DM per day and more NDF and EfNDF than needed. So drop the legume silage to 7.0 lb DM, round off the silage to 20.0 lb, and drop the corn grain to 19.5 lb so that the DMI is correct.

The diet looks good for DMI, NDF, EfNDF, and NEL, but is a little short on and Se. Whether the CP should be increased is debatable and depends on how much you trust an MP system. If you go to the protein tab, note that the MP01 system estimates that this diet is 0.24 lb short on MP per day rather than only lb for Spartan MP system. To be sure to meet the protein needs of these cows, will boost CP a little. So decrease corn grain a little more to 19.0 lb to make for more soybean meal. Let's first see what happens with just solvent-extracted soybean meal (Soy-48); if we increase soy-48 to 7.0 lb/day, the diet has even MP. By dropping corn grain down to 18.5 lb, adding in 2.0 lb of expeller soybean meal, and dropping the soy-48 to 5.5 lb, the protein balance looks very according to the Spartan model.



Dairy Ration: Sample Lactating Cow Ration .MDB finished New diet: 1 Holstein, Lactating cow, Lac:2, Wt:1500 lb, DIM:100, MPD:95.0 lb, MFat:3.6%, DG:0.36 lb/day, DMI:57.4 lb Amount DM %Diet %DMI DM % NDF EfNDF %DM NEL RUP dig %RUP As Fed Grc 🔨 Nutrient Balance CP MIX Feed name %DM %DM Mcal/lb Wheat straw 0.00 0.00 92.7 73.0 73.0 0.39 4.8 65 0.00 34.90 35.1 45.0 45.0 0.65 8.8 70 56.98 Corn silage, normal 32-38% DM 20.00 Legume Silage, 40% NDF 7.00 12.22 42.1 40.0 40.0 0.57 19.0 68 16.63 Corn distillers grains w/ solut 0.00 0.00 90.2 38.8 9.7 0.82 29.7 80 0.00 Cotton seed, whole with lint 3.00 5.24 90.1 50.3 25.2 0.83 23.5 80 3.33 Corn grain, ground, dry 1850 32.28 881 95 2.4 0.89 94 90 21.00 Sovbean meal, solvent, 48% CP 53.8 5,50 9.60 89.5 9.8 2.5 0.92 93 6.15 3.49 89.6 21.7 5.4 0.92 47.0 93 2.23 Soybean meal, expellers, 45%CP 2.00 0.00 97.0 0.0 0.00 Dicalcium phosphate Ca 23% : P 0.00 0.0 0.00 0.0 0 0.44 0.77 99.0 0.0 0.0 0.00 0.0 0 0.45 Limestone MinVit mix (1.5%) - complete LoCa. 1.50 98.0 3.0 0.0 0.00 0.0 0 0.88 0.00 99.0 0.0 0 0.00 Salt-white 0.00 0.0 0.00 0.0 Concentration supplied 57.30 100.00 53.2 28.0 23.1 0.75 16.5 86.3 107.64 Amount DM Ib/day %Diet %DMI DM % NDF Ib/day EINDE NEL Mcal/day As Fed Ib/day CP RUP dig Group lb/day lb/day 'day lb/d 57.30 100.0 53.2 16.1 9.43 107.64 42.9 3.21 Supply 13.2 57.42 16.1 12.9 42.5 9.54 3.18 Requirements Difference -0.11 0.0 0.4 0.4 -0.11 0.03 -10 0 10 Home Fiber Energy Protein Carbohydrate Lipid Mineral Trace Min. Vitamin Amino Acid Cost Misc. +/- % of reqt

Everything looks pretty good but according to the nutrient balance graph, vitamin A is low. We should check the other minerals and vitamins by examining the Mineral, Trace Min, and Vitamin Note that all the vitamin A in the calculated ration supply is from the MinVit mix. All the in the ration other than the MinVit mix are given values of 0 because of the large degree of variation. Thus, the supply is listed as only 47 kIU/day, but it is likely much greater than that.

The

ration

MIX		Feed name		Amount DM Ib	Vit A kIU/lb	Vit D kIU/Ib	Vit E IU/Ib
	Wheat s	traw		0.00	0	0	0
	Corn sila	ige, normal 32-38% DM	1	20.00	0	0	0
	Legume	Silage, 40% NDF		7.00	0	0	0
Ĩ	Corn dis	tillers grains w/ soluble	es, d	0.00	0	0	0
	Cotton s	eed, whole with lint		3.00	0	0	0
Î	Corn gra	iin, ground, dry		18.50	0	0	0
	Soybear	n meal, solvent, 48% C	P	5.50	0	0	0
	Soybear	n meal, expellers, 45%	CP •	2.00	0	0	0
1	Dicalcium phosphate Ca 23% : P			0.00	0	0	0
	Limestor	ne		0.44	0	0	0
	MinVit m	iix (1.5%) - complete L	oCa	0.86	121	30	907
	Salt-whil	te		0.00	0	0	0
	Concen	tration supplied		57.30	0.8	0.2	6.2
iii							а. ()
				Amount DM Ib/day	Vit A kIU/day	Vit D kIU/day	Vit E IU/day
		Su	pply _	57.30	47.31	11.87	354.4
		Requirem	ents	57.42	171.17	28.64	870.8
		Differe	nce	-0.11	-123.86	-16.77	-516.4

Next go to the Cost tab. You can distinguish between feeds that are purchased and those that are homegrown. Note that for feeds that were priced on a 100 pound basis, the Wt AsSold is listed at 99 lb-this is due small rounding errors from shifting and forth from metric and pounds.

Feed name	Amount DM Ib	DM %	Cost AsSold \$	Wt AsSold Ib	Cost DM \$/Ib	Pur- chased?
Wheat straw	0.00	92.7	40.00	2000	0.022	~
Corn silage, normal 32-38% DM	20.00	35.1	36.00	2000	0.051	Г
Legume Silage, 40% NDF	7.00	42.1	40.00	2000	0.048	Г
Corn distillers grains w/ solubles, d	0.00	90.2	100.00	2000	0.055	V
Cotton seed, whole with lint	3.00	90.1	160.00	2000	0.089	1
Corn grain, ground, dry	18.50	88.1	130.00	2000	0.074	Г
Soybean meal, solvent, 48% CP	5.50	89.5	200.00	2000	0.112	1
Soybean meal, expellers, 45%CP	2.00	89.6	220.00	2000	0.123	V
Dicalcium phosphate Ca 23% : P	0.00	97.0	20.00	99	0.208	•
Limestone	0.44	99.0	7.00	99	0.071	
MinVit mix (1.5%) - complete LoCa	0.86	98.0	22.00	99	0.226	1
Salt-white	0.00	99.0	6.00	99	0.061	~
Concentration supplied	57.30	53.2			0.071	
	Amount DM Ib/day	DM %	Cost DM \$/day		Cost DM \$/day	Pur Cost \$/day
Supply	57.30	53.2	4.08		4.08	1.35
Requirements _ Difference _	57.42 -0.11		2			
Fiber Energy Protein Carbohy	drate Lipid Min	eral Tr	ace Min. Vitar	min   Amino Ad	id Cost	Misc.

to back

DM

NDF

EfNDE

NEL

CP

MP

RDP

Ca

p

Se

Vit A

Next examine the Ratios and Relationships dialog. Energy-corrected milk is a relative value that adjusts for milk that is higher in and protein than the average (3.5% fat). Note that the actual DMI is the value that inserted in the animal description dialog. Using this actual DMI, the allowable milk is

Intake	and a second	Diet Composition		ana		
Actual DMI:	57.00 lb/day	Forage in diet:	47.12	%DM	OK	
DMI / BW:	3.80 %BW	Forage NDF:	73.5	%NDF		
NRC01 Predicted DMI:	59.69 lb/day	CP / ME3X:	558.98	g/Mcal		
DEp / DE1X:	92.80 %	MP / ME:	44.99	g/Mcal		
Energy-corrected milk (ECM):	95.19 lb/day	Lys : Met:	3.01			
ECM / DMI:	1.67	NRC01 Lys : Met:	3.48			
		NRC01 Lys:	2.84	%MP		fat
- Production / Daily Gain		NRC01 Met:	0.82	%MP		140
Energy-allowable milk:	94 39 lb/day				1	
Protein-allowable milk:	94.79 lb/day	- Nutrient Management ()	N. P. KI		7	1
Target body energy balance:	0.73 Mcal/day	Predicted Fecal DM:	18.19	lb/day		
Target body protein balance:	0.11 lb/day	N captured:	35.2	%		
		Total N excreted:	0.972	lb/day		We
6 1		Fecal N:	0.360	lb/day		
Losts	10.70 4100 41	Urinary N:	0.613	lb/day		
Feed cost / ME3X:	12.72 \$/100 Mcal	P captured:	38.0	%		
Purchased reed costs:	1.35 \$/day	P excreted:	0.141	lb/day		
Feed cost / TUU wt milk:	4.36 \$/1001b	P excreted as P205:	0.323	lb/day		
Income over feed costs:	11.01 \$/day	K excreted as K20:	0.751	lb/day		1
		Les			1	1
ully happening	Feed Relationsh	nips F	eed Rela	tionships		1
any nappening.	College and all	ala with lint				

very close to what is actually happening.

You can get some of this same type of on an individual feed basis by choosing **Feeds>Feed Relationships** of the Worksheet menu.

Feed Relationships			Feed Relat	Feed Relationships				
Cotton see	d, whole	with lint	Corn grain	, ground,	dry			
CP : ME Lianin	85.27 25.6	g/Mcal %NDF	CP : ME Lignin	30.72 9.5	g/Mcal %NDF	inf		
ADF : NDF	0.80		ADF : NDF	0.36				
Cost ME	0.071	\$/Mcal	Cost ME	0.053	\$/Mcal			
		OK			ОК			

## 6. Printing a Batch Report

If you want to print the recipe to make a batch of this ration, choose **Reports>Batch Report.** 

File Feeds Animal Ration	Reports Settings Tabs
ð 🖬 👸	Mix Report B Batch Report
<b>5</b> Dairy Ration: S	Office Report

In the Modify Report Settings dialog, you can input information regarding the ration was prepared for by and choose whether to alternating colors on the output. You can also change the size of the batch, number of animals for incrementing batch size recipe, the order of feeds, or write notes to print on the report.



To move to the next step, press **Print**. This directs you the Output Options dialog. First take a quick look at the report on your monitor by choosing Preview. You can also to a printer or to a file so that the batch report can be emailed someone else.

If you have printed this ration before and the settings are already set, you can choose one of the Report hot buttons instead of using the menu. The hot buttons 🕅 🖺 🔊 📀 quickly take you to the Output Options dialog.

#### 7. Saving the Ration

To save the revised ration, choose **File>Save** As or **File>Save**, like with any other Windows program.

