

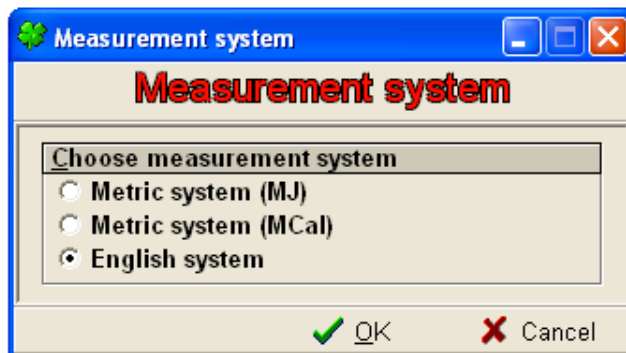
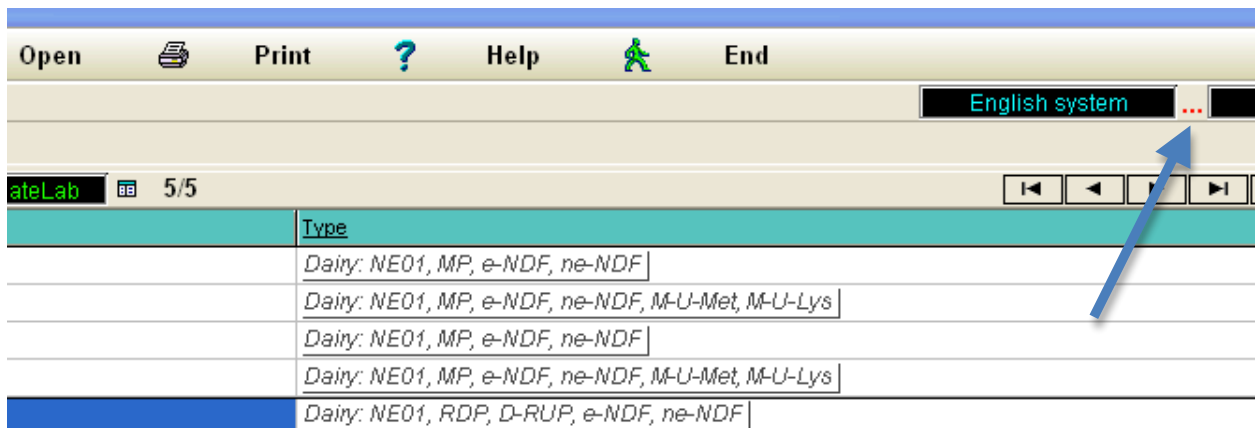
Sesame 3.5 Basic Tutorial

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Problem 1

Feed prices have been fluctuating a lot in the last few years. You want to evaluate feedstuffs for the Midwest region based on their NE_L, metabolizable protein (**MP**), effective NDF (**eNDF**), and non-effective NDF (**neNDF**) content. You assume that the feeds have the same nutritional composition as those in the NRC 2001.

Click [*Solver*], then click on *Generic Problems*, and finally on *Midwest - Generic [3]*. In the *Solver* menu (top), click on [*Database*], choose [*Copy Problem*], and give it a new name, e.g. *workshop 1*. Click on *User Problems* in the top left window and you should see the new problem. At this point we will not add any new feeds to the problem. Make sure that you are using the English unit system. This is done by clicking on the [...] button, as shown below.



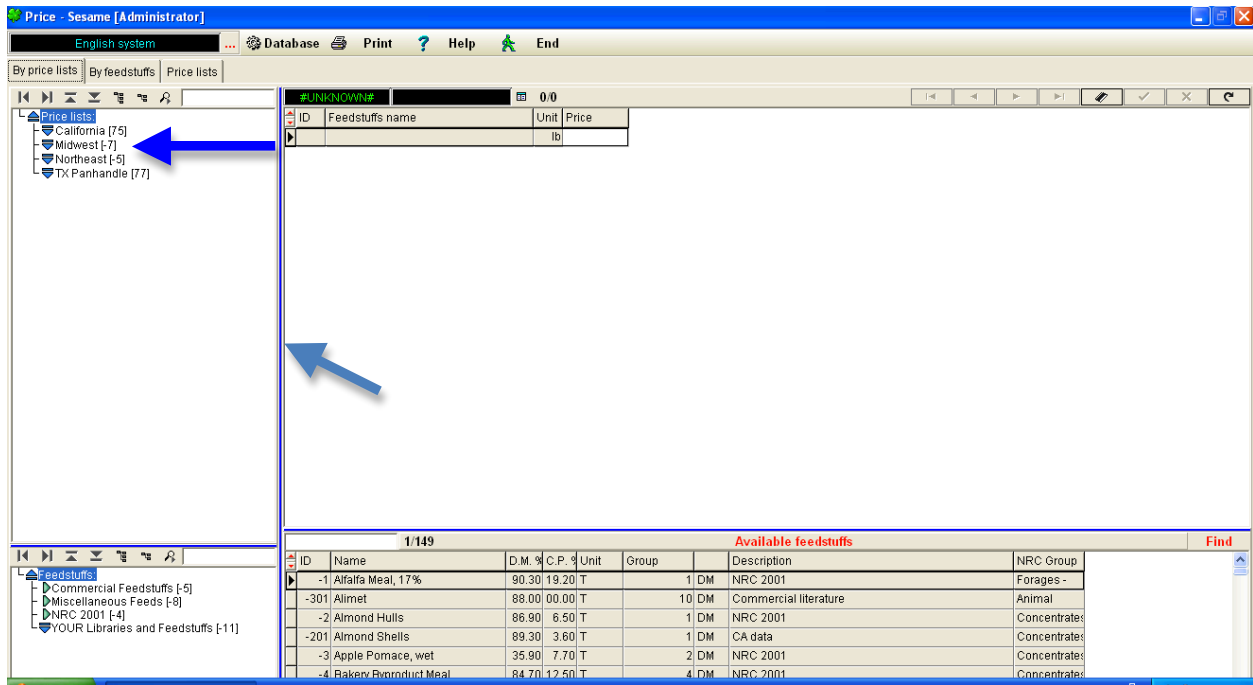
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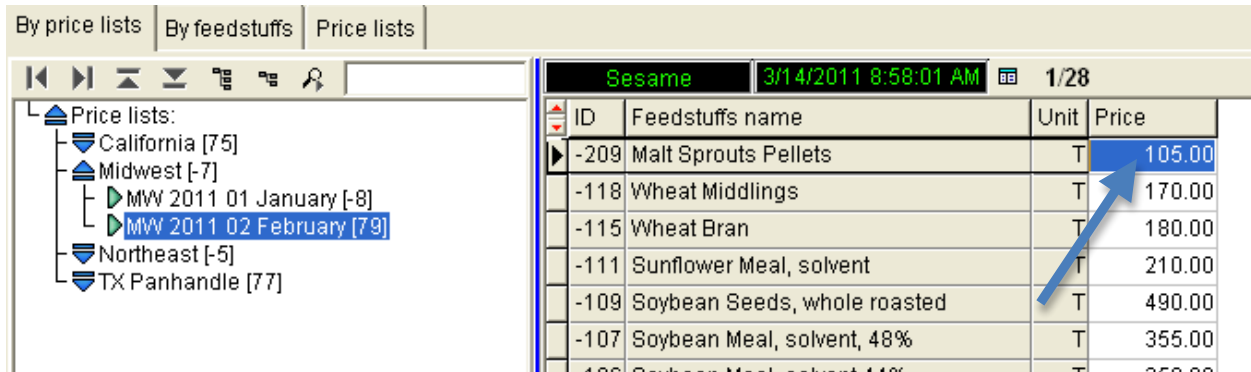
There are two ways to edit feed prices: 1) they can be edited directly in the *Solver* screen, or 2) they can be edited from *Price lists* in the main menu. If you are going to be running the same problem repeatedly over time, it is simpler to keep the same problem, and just update the price list by copying it. Price lists can be accessed directly from the main menu (planet earth), or via a short cut in *Solver*. We will use the shortcut here. Click the [*Price lists*] button in the *Solver* menu. This is a screen shot of the *Price lists* display when it opens:



Note that the blue dividing lines separating the display into 4 windows can be moved to fit your screen; this is true throughout Sesame. We have already prepared a few price lists for you and arranged them in four libraries. Double-click the [*Midwest*] price list library (where the dark blue arrow is in the figure above). The display expands to show all price lists belonging to this library. In this instance, there is only one price lists: *MW 2011 01 January [-8]*. We will use this list as a starting point. First select the *MW 2011 01 January [-8]* price list by clicking on it in the top left window. Then, click on [*Database*] -> [*Copy Price list Library*]. Sesame opens a small window and suggests a default price lists name. The default would work, but we will select a name that will make the listing of our price lists much tidier. In the *Price List Name* window, overwrite the default name with: *MW 2011 02 February*. This new price lists is automatically added to the tree window (top left) in the Midwest library. Price lists in this tree window are sorted alphabetically. Thus, *MW 2011 02 February* comes after *MW 2011 01 January*. Using a code of Region--Year--Month--Month-alpha to name our new price list ensures a logical (time series) sorting.

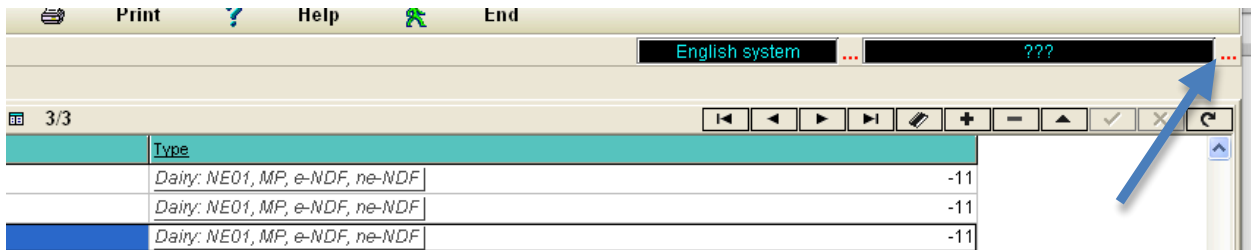
This is where you could update all your feedstuffs prices. In this example, we will update only the malt sprouts price to keep this tutorial short. Change its price from \$105 to \$135/ton by clicking and entering the new price in the price cell.

Note: Sesame operates on a database platform. An entry is not saved in the database until the cursor has moved to a new record. In this example, simply pressing [return] moves the cursor to the next record, but this would not necessarily occur everywhere in Sesame. It is always a good idea to click the  button in the menu bar (top right) to refresh the database.

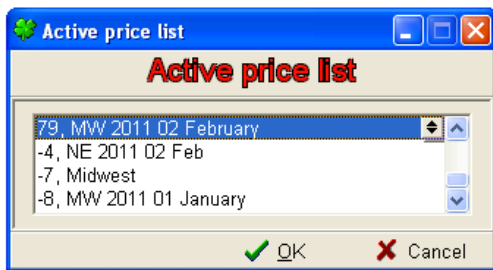


ID	Feedstuffs name	Unit	Price
-209	Malt Sprouts Pellets	T	105.00
-118	Wheat Middlings	T	170.00
-115	Wheat Bran	T	180.00
-111	Sunflower Meal, solvent	T	210.00
-109	Soybean Seeds, whole roasted	T	490.00
-107	Soybean Meal, solvent, 48%	T	355.00

Now you are ready to solve the problem. Return to *Solver* by clicking [End] in the *Price* module menu. This brings you back directly to the *Solver* module. Select *workshop 1* under the *Users Problems* in the upper left hand window. You will see in the upper right hand window that this problem is already set to solve on NE1, MP, eNDF, and neNDF. The feedstuffs are in the lower left-hand window, but the prices haven't been updated yet. Select the correct price list by clicking on "... " in the upper right hand corner and choosing *MW 2011 02 February* on the pull-down list.



Type	
Dairy: NE01, MP, e-NDF, ne-NDF	-11
Dairy: NE01, MP, e-NDF, ne-NDF	-11
Dairy: NE01, MP, e-NDF, ne-NDF	-11



Active price list

79, MW 2011 02 February

-4, NE 2011 02 Feb

-7, Midwest

-8, MW 2011 01 January

OK Cancel

For some reasons, soybean hulls are not available; we would like to take this feed out of the problem. It can either be (1) permanently deleted from the problem by clicking the ‘-‘ button in the task bar, or (2) temporarily eliminated from the test by un-checking the “in-test” box, or (3) by moving it from the *Calibration* to the *Appraisal* set (just click-drag-and drop from the *Calibration* to the *Appraisal* window). In this example, we picked option (2).

ID	Feedstuffs name	In test	Price	Unit
-118	Wheat Middlings	<input checked="" type="checkbox"/>	170.00	T
-109	Soybean Seeds, whole roasted	<input checked="" type="checkbox"/>	490.00	T
-107	Soybean Meal, solvent, 48%	<input checked="" type="checkbox"/>	355.00	T
-115	Wheat Bran	<input checked="" type="checkbox"/>	180.00	T
-103	Soybean Hulls	<input type="checkbox"/>	155.00	T
-85	Linseed Meal, solvent	<input checked="" type="checkbox"/>	270.00	T

Choose *Solve Problem* from the top menu. This opens the Wizzard™ window. The default solver options are to Solve using the Wizzard with a Variance inflation threshold of 15 and a Student residual threshold of 2.5. Generally, you don’t want to change these options, so we will use the defaults and change only the milk price from 0.14 to 0.18/lb. The milk price is important for calculating the price adjustments of forages. Press [OK] to solve the problem.

workshop 1

workshop 1

With intercept

Wizzard(tm) type

Standard Solver

Solve using the Wizzard(tm)

Solve using the Stepwise Wizzard(tm)

Wizzard options

Variance inflation threshold 15

Student res. threshold 2.5

Leverage detection

Include log with report


Use forage adjustments

Milk price/lb 0.18

OK Cancel

The first section of the report shows the Price Prediction Reliability (**PPR**) and the estimates of nutrient costs. The PPR is a measure of the error in the model. As satisfactory solution should have a PPR less than 20% of the average feed price in the problem. In this problem, the average price was \$260.50. The PPR of 39.54 is only 15.2% of the average price, so the solution should be very good.

Note: How do we know what is the average price? There are two buttons at the bottom of the solution screen. Select 'Full report' and the number appearing under 'Dep Mean' in the Main results table is the average feed price.

 **workshop 1**

→ Price Prediction Reliability 39.944

→ **Estimate of Nutrient Unit Costs**

Nutrient name	Estimate	
NEI - 3X (2001)	0.086661	**
Metabolizable Protein (MP, g/lb)	0.407165	**
e-NDF	0.066242	*
ne-NDF	-0.012095	

→ - A blank means that the nutrient unit cost is likely equal to zero
 → - ~ means that the nutrient unit cost may be close to zero
 → - * means that the nutrient unit cost is unlikely to be equal to zero
 → - ** means that the nutrient unit cost is most likely not equal to zero

The numbers in the 'Estimate' column are the estimated costs per unit for each nutrient selected in the problem. In this problem, for example, net energy costs 8.67¢/Mcal while MP costs 40.7¢/lb.

Calibration set							
Name	Actual [T]	Predicted [T]	Lower limit	Upper limit	Corrected	75.0% CI	75.0% CI
Bakery Byproduct Meal	270.000	212.157	192.820	231.494	-	-	-
Beet Sugar Pulp, dried	230.000	195.125	182.217	208.033	-	-	-
Blood Meal, ring dried	660.000	643.041	608.366	677.717	-	-	-
Canola Meal, mech. extracted	257.000	241.634	231.148	252.121	-	-	-
Corn Grain, ground, dry	240.000	214.658	196.745	232.571	-	-	-
Corn Silage, 35% DM	45.000	74.715	67.145	82.284	74.715	67.145	82.284
Cotton Seed Hulls	155.000	106.243	73.406	139.080	-	-	-
Cotton Seed Meal, 41% CP	295.000	313.981	302.138	325.825	-	-	-
Cotton Seed, Whole w lint	275.000	272.208	237.185	307.230	-	-	-
Distillers Dried Grains w Sol	195.000	266.964	250.214	283.714	-	-	-
Gluten Feed, dry	159.000	217.448	206.147	228.750	-	-	-
Gluten Meal, dry	558.000	524.202	501.064	547.340	-	-	-
Hominy	183.000	198.736	184.072	213.399	-	-	-
Leg Hay, all samples	160.000	182.305	159.111	205.499	203.154	179.960	226.348
Linseed Meal, solvent	270.000	258.908	245.886	271.931	-	-	-
Malt Sprouts Pellets	135.000	182.544	166.107	198.982	-	-	-
Meat Meal, rendered	340.000	375.999	357.818	394.179	-	-	-
Molasses, Sugarcane	180.000	143.595	127.452	159.739	-	-	-
Soybean Meal, expellers	380.000	431.979	416.320	447.638	-	-	-
Soybean Meal, solvent 44%	350.000	309.233	296.211	322.256	-	-	-
Soybean Meal, solvent, 48%	355.000	355.300	341.142	369.458	-	-	-
Sunflower Meal, solvent	210.000	161.642	144.861	178.423	-	-	-
Wheat Bran	180.000	163.962	144.597	183.327	-	-	-
Wheat Middlings	170.000	180.387	163.570	197.205	-	-	-

The *Calibration set* table reports the results for the feeds that were in the calibration set (i.e., those feeds for which we had both a composition and a market price). The numbers in the columns have the following meanings: *Actual[/T]* are the prices that we entered in the problem; *Predicted[/T]* are the estimated break-even prices; *Lower limit* are the 12.5% lower confidence intervals on the estimated prices; *Upper limit* are the 87.5% upper confidence intervals on the estimated prices; *Corrected* are only reported for forages – they include correction factors on the estimated values of forages based on the work of Weiss and St-Pierre; the last two columns labeled *75.0% CL* are the 75% confidence limits on the corrected prices. Feeds with an actual price/ton less than the *Lower limit* are deemed bargains; those with an actual price exceeding the *Upper limit* should be considered over-priced.

The last section of the report shows the results for the *Appraisal set* and also displays a *Calculation log*. When we submitted the problem there were no feeds in the *Appraisal set*. But while solving, Sesame determined that the actual prices of Fish Menhaden Meal, Soybean Seeds, whole roasted, and Tallow were so different from their calculated values that they should be deemed outliers. In such instances, Sesame automatically moves the outlier feeds to the *Appraisal set*, where they have no impact whatsoever on the solution. This movement of outlier feeds from the *Calibration* to the *Appraisal set* is done sequentially. The sequence is reported in the *Calculation log*.

Appraisal set			
Name	Actual [/T]	Predicted [/T]	Corrected
Fish Menhaden Meal, mech.	1450.000	513.482	-
Soybean Seeds, whole roas	490.000	355.663	-
Tallow	980.000	447.193	-

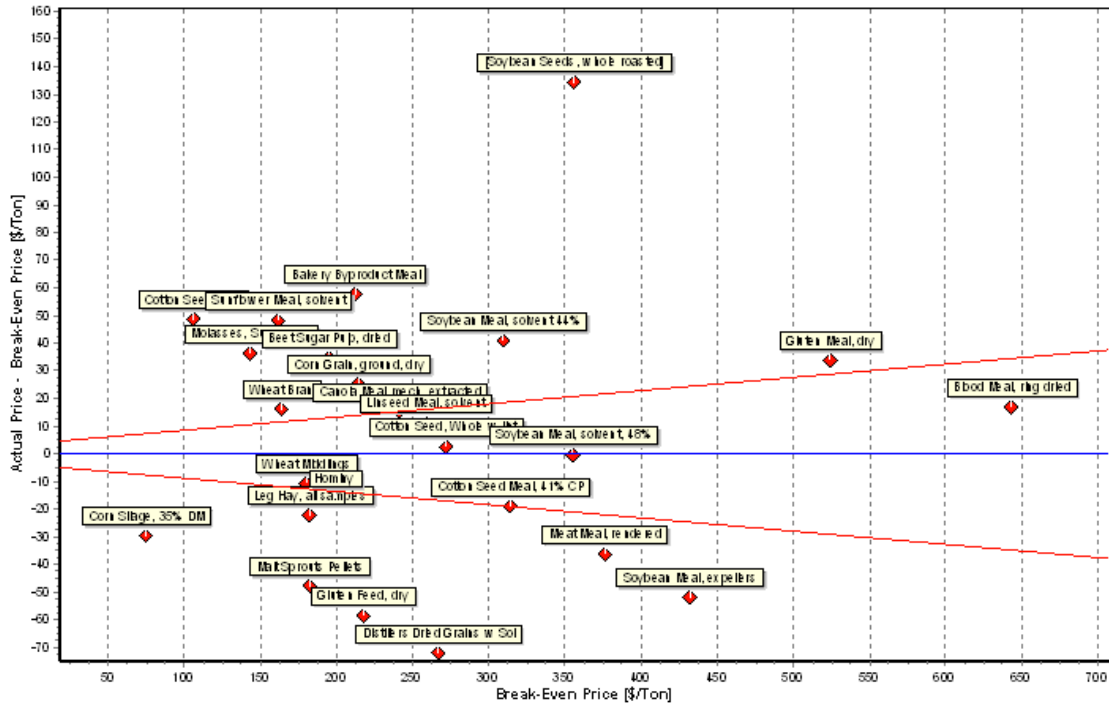
Calculation log	
Action	Reason
Feedstuffs "Fish Menhaden Meal, mech." removed	Outlier
Feedstuffs "Tallow" removed	Outlier
Feedstuffs "Soybean Seeds, whole roasted" removed	Outlier

Results can also be viewed in a graphic format. Click the [*Graph*] button in the *Report* menu. This opens a *Graph Style* window.



The second option is used to block the display of feeds that are substantially different than the average price. In this example, change this limit to 200%; then click OK. The following graph is displayed. Feeds above the top red line are over-priced. Feeds below the bottom red line are under-priced. Feeds between the two red lines are priced relatively close to their calculated break-even values. Beware of how you are interpreting these results. The results do not imply that a ration can be balanced using only bargain feeds, or that a ration can be balanced without using any of the over-priced feeds. But as one balances specific rations on a farm, a coherent strategy is to maximize the use of bargain feeds and to minimize the use of over-priced feeds while maintaining a balanced ration. Also, some feeds are used in rations for reasons other than their nutritional content in NE_L, MP, e-NDF, and ne-NDF. For example, molasses can be used to stick fine particles to large particles in the diet so as to avoid separation of the ingredients in the TMR. In our example, molasses is over-priced by \$47/ton. The average cost of using molasses as a 'TMR glue' is thus ~ 2.35¢/lb of molasses.

workshop 1



Problem 2

Next you would like to look at the value of a defatted, high protein distillers dried grains. Begin by making a copy of Problem 1. In the *Solver* module, select *workshop 1* in the *User problems* library in the tree window (top-left window). In the *Solver* menu, click on *Database > Copy problem*) and name it *workshop 2*.

Next, we need to add the new DDGS feed to our feed library. Close the *Solver* module by clicking on [End]; this brings you to the *Main Menu* (planet earth). Select the *Feedstuffs* module (top left); this opens the *Feedstuffs* module. This module is used for creating, copying, or editing feedstuffs.

Feedstuffs database - Sesame [Administrator]

Composition Price lists Database Find Print ? Help End

English system Feedstuffs
MW 2011 02 February Libraries

OSU 3/14/2011 9:21:09 AM 1/149

ID	Group	Name	DM/AF	D.M. %	C.P. %	Unit	NRC Group	Description	
-315	Enel	4 Barley Feed	In L	1	91.00	12.40	T 1	Concentrates	4 NRC 2001
-314	Enel	4 Wheat Feed	In L	1	89.40	14.20	T 1	Concentrates	4 NRC 2001
-313	Otl	10 Smartamine M 5% Premix	In L	1	5.00	70.00	T 1	Animal Byproducts	6 Commercial literature
-312	Otl	10 Soy Plus	In L	1	89.09	49.84	T 1	Concentrates	4 Commercial literature
-311	Otl	10 Soy Pass	In L	1	88.00	52.61	T 1	Concentrates	4 Commercial literature
-310	Otl	10 Soy Best	In L	1	88.00	48.30	T 1	Concentrates	4 Commercial literature
-309	Otl	10 Smartamine M	In L	1	98.00	70.00	T 1	Animal Byproducts	6 Commercial literature
-308	Otl	10 Prov.A.I Preferred	In L	1	90.00	91.00	T 1	Animal Byproducts	6 Commercial literature
-307	Otl	10 Prolek	In L	1	93.00	77.42	T 1	Animal Byproducts	6 Commercial literature

Feedstuffs:
 Commercial Feedstuffs [-5]
 Miscellaneous Feeds [-8]
 NRC 2001 [-4]
 YOUR Libraries and Feedstuffs [-11]

All feeds belong to the *Feedstuffs* library. In addition, they can be attached for convenience in either one of the 3 libraries that we created (*Commercial Feedstuffs*, *Miscellaneous Feeds*, or *NRC 2001*), or in your own libraries and feedstuffs (*Your Libraries and Feedstuffs*).

Click on the *NRC 2001* library (upper left window); then choose (click) on *-23 Distillers Dried Grains wSol* in the upper right window. Note that feeds are listed in ascending ID numbers.

Note. You cannot edit the composition of feeds with a negative ID number (e.g., -315 for Barley Feed). These are 'protected' feeds. If you want to change the nutritional composition of a protected feed, you must first create a copy of the feed and edit the copy, which will have a positive ID number.

In the *Feedstuffs* module menu, select *Database > Copy Feedstuff*, and name the new feed *hi pro DDGS*. In the tree of libraries window (top left), click on *YOUR libraries and Feedstuffs*. Your newly created feed will appear in the *Feedstuffs* windows as ID=55, Name=hi pro DDGS.

Note. The feed ID number for your copy might not be [55]. Don't worry if it is not. Sesame has its own way of numbering feeds to ensure that no two feeds share the same ID number.

Click on *hi pro DDGS* in the *Feedstuffs* (upper right) window, and then click on [*Composition*] on the top menu. This will open the *nutrient composition* window. In the upper left window, select *Basic Nutrients (Across Species)*. Nutrients are grouped in sub-libraries for ease of entry. Double-clicking on any of the sub-libraries expands the display in both the *nutrient library* tree window (top left) and *nutrient* window (top right). For simplicity, we are going to assume that the process for producing this DDGS only affects crude protein and ether extract, not ash and NDF. In the *nutrient* (upper right) window change Crude protein from 29.7 to 40% and Ether extract from 10 to 5%. Notice that the NFE and NFC changed, since they are calculated values. Nutrients with an in the *Use formula* column are automatically calculated using equations stored in Sesame.

Note. What nutrients should be entered in Sesame? The answer depends on which nutrients will be selected in the problem. If the suggested nutrient group [-11] is used (NE_L, MP, e-NDF, and e-NDF) then the following nutrients must have a valid entry for the nutrients to be properly calculated (Sesame uses the NRC(2001) model for its calculation):

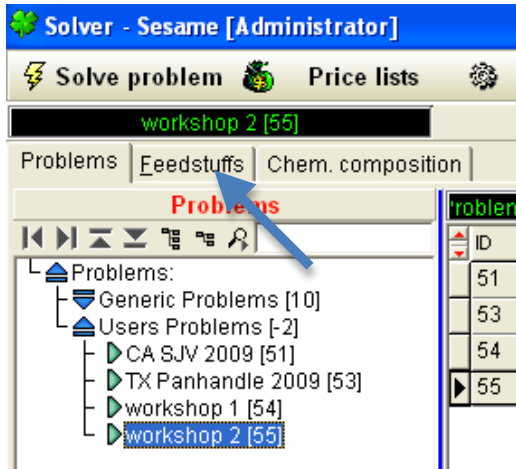
[-1] DM	[-2] CP	[-3] Ether extracts
[-5] Ash	[-8] NDF	[-11] Lignin
[-14] NDICP	[-300] RUP	[-301] RUP digestibility
[-302] NDF effectiveness		

Some feeds also require:

- [-297] Processing adj. factor – used for some processed grains
- [-298] True protein digestibility – required for animal proteins
- [-299] True fatty acids digestibility – required by high fat ingredients

Do not forget to click on the refresh data button (upper right task bar) before leaving this screen or else your composition changes will not be saved. Click [End] to leave the *Composition* screen, followed by another [End] to leave the *Feedstuffs* module. You should be back to the main menu (planet earth).

Click *Solver* to access the *Solver* module. Click on *User Problems* and select *workshop 2* in the upper left window. The problem should have the same nutrient basis and feedstuffs as Problem 1. Click on the *Feedstuffs* tab.



This opens your feed libraries. Click on *Your Libraries and Feedstuffs* in the *feed library* window (top left). The ingredient *hi pro DDGS* now shows up in the *feedstuffs* (upper right) window. Click-drag-and-drop *hi pro DDGS* into the *Appraisal set* window (bottom right). We don't know what the price of this feed really is, which is why we put it in the *Appraisal set*. Had we known both its composition and price, we would have put it in the *Calibration set*. Although we do not know what its price really is, we think that it should be about \$10/ton over regular DDGS. So we right click on the price cell to change its price to \$205/Ton.

Note. We are entering a new price only to illustrate how prices can be changed 'on the fly' in the *Solver*. The price of any feed in the *Appraisal set* has no impact whatsoever on the solution and, hence, its estimated break-even price.

Click [*Solve Problem*] from the top menu and go through the same steps as in problem 1. In the results, note that the average price of the feedstuffs (Dep mean) and the nutrient values are unchanged from Problem 1 since we did not change any feeds in the *Calibration set*. The predicted value of the defatted, high protein DDGS is \$289.74/Ton.

Problem 3

Instead of evaluating feeds based on MP, you want to evaluate them based on rumen degradable

protein (**RDP**) and digestible rumen undegradable protein (**DRUP**). Begin by copying *workshop 2* as you did in Problem 2, naming the copied problem *workshop 3*.

Make sure that *workshop 3* is selected (i.e., click on *workshop 3*). Then, in the upper right window, double-click on the *Type* cell for *workshop 3*.

ID	Problem name	Type
51	CA SJV 2009	Dairy: NE01, MP, e-NDF, ne-NDF -11
53	TX Panhandle 2009	Dairy: NE01, MP, e-NDF, ne-NDF -11
54	workshop 1	Dairy: NE01, MP, e-NDF, ne-NDF -11
55	workshop 2	Dairy: NE01, MP, e-NDF, ne-NDF -11
56	workshop 3	Dairy: NE01, MP, e-NDF, ne-NDF -11

A new window will open with several pre-programmed choices.

ID	Name
-2	Dairy: NE01, CP
-3	Dairy: NE01, CP, NDF
-4	Dairy: NE01, RDP, RUP
-5	Dairy: NE01, RDP, RUP, NDF
-6	Dairy: NE01, RDP, RUP, e-NDF, ne-NDF
-7	Dairy: NE01, RDP, RUP, e-NDF, ne-NDF, U-Met, U-Lys
-8	Dairy: NE01, RDP, D-RUP
-9	Dairy: NE01, RDP, D-RUP, e-NDF, ne-NDF
-10	Dairy: NE01, RDP, D-RUP, e-NDF, ne-NDF, U-Met, U-Lys
-11	Dairy: NE01, MP, e-NDF, ne-NDF
-12	Dairy: NE01, MP, e-NDF, ne-NDF, M-U-Met, M-U-Lys
-13	Empty
-14	Empty
-15	Heifers: ME01, CP
-16	Heifers: ME01, RDP, RUP
-17	Heifers: ME01, RDP, RUP, NDF
-18	Heifers: ME01, RDP, RUP, e-NDF, ne-NDF
1	Poultry: TND, CP, Met, Lys
2	Poultry:TDN, CP, Met, Lys, Thr

Choose *-9 Dairy: NE1, RDP, D-RUP, eNDF, neNDF*. Then click the refresh button in the top right task bar to make sure that your changes have been saved.

Note. It is possible to program your own nutrient choices, but this is a topic for an advanced Sesame user. You must learn to walk before you run...

Click on *Solve problem*, and keep all the same defaults for solving as what were used in problems 1 and 2.

Price Prediction Reliability	48.630
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<i>Estimate of Nutrient Unit Costs</i>		
Nutrient name	Estimate	
NEI - 3X (2001)	0.129850	**
RDP	-0.017684	
Digestible RUP	0.374633	**
e-NDF	0.057232	~
ne-NDF	-0.016103	

- A blank means that the nutrient unit cost is likely equal to zero
- ~ means that the nutrient unit cost may be close to zero
- * means that the nutrient unit cost is unlikely to be equal to zero
- ** means that the nutrient unit cost is most likely not equal to zero

Notice that the Price Prediction Reliability is greater than what we had in problems 1 and 2 when we solved for MP as opposed to RDP and dRUP. In this instance, solving for MP is better than solving for RDP and dRUP. It is not always like that. Some people prefer solving for MP, arguing that the protein requirements of a cow are best expressed in terms of MP, while others prefer RDP and dRUP, arguing that these 2 nutrients can be measured, while MP is entirely calculated – even in research. As long as you maintain the same group of nutrients, feed comparison across time should be valid. Also, generally there are little meaningful differences between the calculated break-even prices using either set of nutrients.

Summary

In this tutorial, you learned how to:

1. Set up a problem with a Calibration set of feedstuffs and an appropriate price list.
2. Copy and Edit price lists.
3. Copy and Edit feedstuffs.
4. Change the nutrient values for the basis of the analysis.
5. Interpret Sesame 3.5 reports.

Keep exploring Sesame on your own. Periodically, **you should back-up your data files** in case something happens to your system, or if things become so messed up that you want to start back where things were working. To backup your data, select [*Backup*] on the main menu (planet earth), then select *backup*. Sesame will automatically create a .zip file containing all your data and will name it based on the date and time of your backup. Don't forget to make a copy of the backup files on something else than your hard drive because you don't want to lose all your work if your hard drive ever fails (and they all do... eventually).