MixitWin Reference Manual

Version 7, updated April 16, 2019

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Introduction to MixitWin

The MIXIT-WIN program
MIXIT-WIN is a professional feed formulation program for Windows that is powerful, flexible, and easy to use. MIXIT-WIN has all of the features of a modern single-mix feed formulation program including a list of common ingredients with their nutrient amounts and the ability to mix these ingredients into rations and print reports based on these rations. Producers and nutritionists use MIXIT-WIN to calculate rations and ration supplements for all types of animals.

With its related programs, MIXIT-WIN is also suitable for nutritional consulting for clients with different ingredient prices, nutrition and product research, and feed mill operations that involve inventory control, feed labels, price sheets, and invoices.

Unlimited number of ingredients, nutrients and rations
MIXIT-WIN saves an unlimited* number of ingredients, nutrients, and rations; balances rations with an unlimited number of ingredients, nutrients and constraints; prints balanced ration reports and batch weight reports for mill operators; sends data to spreadsheets or text files; uses the American or metric system; and selects English, Spanish, or another language. Additional features help you work faster and more efficiently and print the results in a wide variety of reports.
* This “unlimited number” is limited by computer memory.

Related programs
MIXIT-WIN has related programs for automatic processing, parametric reports, inventory control, price sheets, invoices, feed labels, client prices and multi-blending.

Rations
The purpose of a feed formulation program is to create rations, and MIXIT-WIN lets you create two types of rations. In one type you select the ingredients and their amounts and MIXIT-WIN calculates the nutrient content of the ration; this is a “hand-entered ration.” In the second, you specify constraints that the ration must satisfy, such as minimum or maximum amounts of protein and energy, and MIXIT-WIN selects the ingredients and their amounts; this is a “balanced ration.”

Least cost rations
A balanced ration is not always possible; for example, you may ask for a ration with 20% energy from ingredients that individually contain less than that amount of energy. When a balanced ration is possible, however, many different rations will also satisfy the same constraints, and MIXIT-WIN must choose one of them. In this case, MIXIT-WIN chooses

a “least-cost” balanced ration; that is, a ration with the property that no other balanced ration has a lower price per pound or per ton with respect to the current ingredient prices.

As fed and dry matter
Each ration has a nutrient content -- an average of the nutrient contents of the individual ingredients in the ration -- that can be described on an as fed basis or a dry matter basis.

The term ‘as fed’ refers to the feed as the animal consumes it. Similar terms are air dry, as received, fresh, green, and wet. The term ‘dry matter’ (dry m. or DM) refers to a sample of material that has been dried until all the moisture has been removed. Similar terms are 100% dry matter, and moisture free.

The as fed amount of a nutrient in a ration cannot exceed its dry matter amount. For example, two kilograms of wet hay that contain 100 grams of protein and 50% moisture have 5% protein on an as fed basis, and 10% protein on a dry matter basis, as shown below.

Protein in wet hay	**Protein in dry hay**
100 grams protein	100 grams protein
1 kilogram dry matter	1 kilogram dry matter
1 kilogram water	0 kilograms water
5% protein (as fed)	10% protein (dry m.)

MIXIT-WIN formulas
MIXIT-WIN stores rations in containers called ‘formulas’. A single formula is a collection of many things, including a formula name, dry matter intake, dates, a current ration, and a balanced ration. The current ration of a formula can be a hand-entered ration or a balanced ration; that is, a hand-entered ration can coexist in the same formula with a balanced ration. You should think of the current ration as the production ration, and the balanced ration as an experimental ration that may possibly become the next production ration. To summarize, each formula contains:

A Current Ration	**A Balanced Ration**	**Other Data**
A hand-entered or balanced ration for production use.	A temporary ration that may be saved as the current ration.	Name, memo, intake, usage, dates, etc.

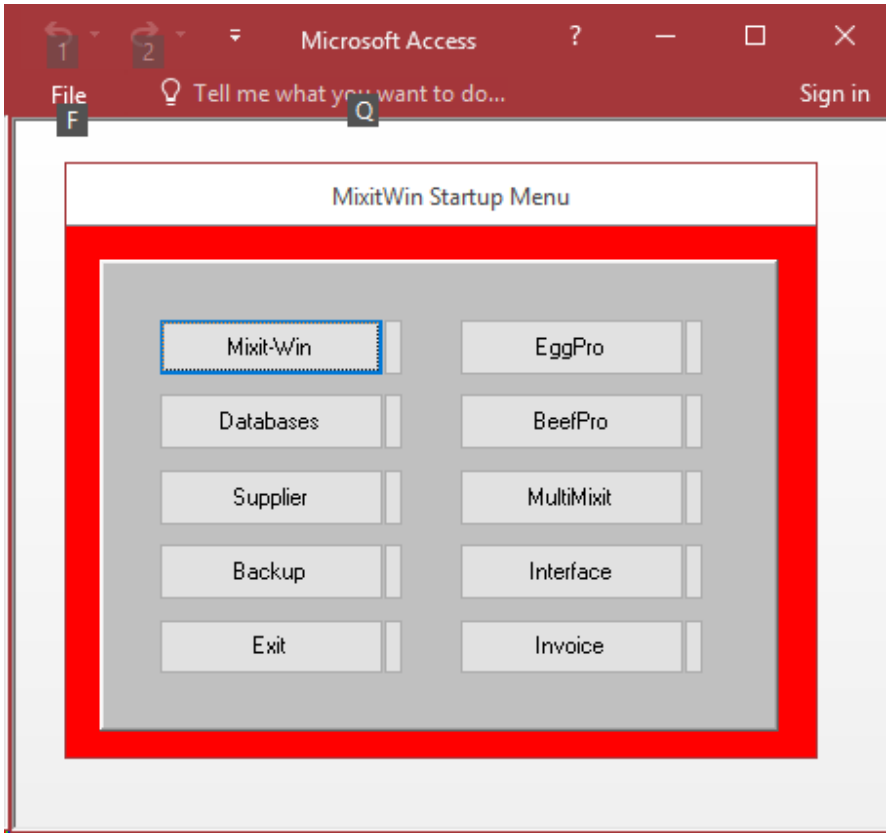
Starting MixitWin

Starting MIXIT-WIN
The MIXIT-WIN program is started in the following way:

1. From the Windows desktop, click the MIXIT-WIN icon.
2. In the MIXIT-WIN startup menu, click the Mixit-Win button.
3. Click the OK button.

Help
Press the F1 function key for help with MIXIT-WIN. Click underlined words for more information. Browse forward (>>) or browse backward (<<) to see related topics.

The Startup Menu



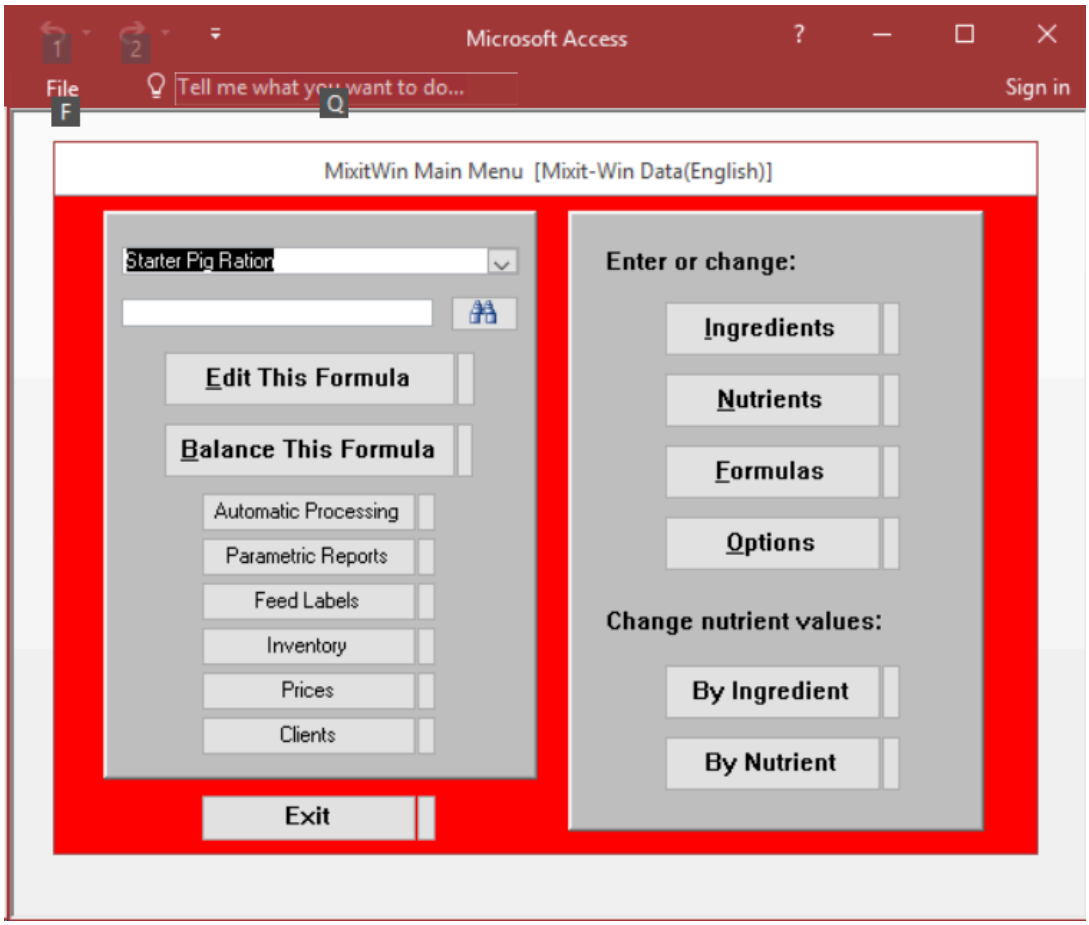
The startup menu
Click the MIXIT-WIN icon on the desktop and a menu appears with these buttons.

Mixit-Win	Opens the Main Menu and starts the MIXIT-WIN feed formulation program.
Databases	Select databases and a language; backup and import data.
Supplier	Write purchase orders and receive products from vendors.
Backup	Back up data for several programs automatically.
EggPro	Make rations for laying hens; save house and breed data.
BeefPro	Make feeding schedules and see the profitability of a feedlot.
MultiMixit	Find least cost rations with limited ingredient inventory.
InterFace	See the interface with the Invoice program or a feed mill.

Invoice Write invoices using the Prices program.

Next to each button in the MIXIT-WIN startup menu is a narrow help button. When you are working in a program, press the F1 function key for help. (Click underlined words for more information.)

The Main Menu



After clicking Mixit-Win on the Startup Menu, the Main Menu appears. The drop-down box at the upper left side of the main menu is the formula selection box. Click the arrow at the right side of this box with a mouse and a list of formula names appears. Click any name in this list with a mouse. The list closes and the name that you selected appears in the box. Below the drop-down box is a find box and a select button that help you find a formula when you know part of its name.

Click the Edit This Formula button to make and print a current ration. Click the Balance This Formula button to make and print a balanced ration and save it as the current ration.

The buttons on the right side of the main window assist in making rations. These are the Ingredients, Nutrients and Formulas buttons, which are used to enter and change the names of ingredients, nutrients and formulas; the Options button, which changes weight units and prices; and the By Ingredient and By Nutrient buttons, which are used to enter and change the nutrient composition of ingredients.
Dksnf dsffd

Help
Next to each button in the MIXIT-WIN main menu is a help button. Press the F1 function key for help with MIXIT-WIN. (Click underlined words for more information.)

Exit buttons
All windows of MIXIT-WIN have an Exit button. This is a button with X or the word “Exit”. Click the Exit button to exit the window and save your work.

Formulas and Rations

Rations
A ration is a mixture of ingredients to form a complete animal feed, a feed concentrate or a feed additive. The main purpose of a feed formulation program is the creation of rations, and MIXIT-WIN lets you create two kinds of rations. In one you select the ingredients and their amounts and MIXIT-WIN calculates the nutrient content and daily amounts of the ration; this is a hand-entered or “current ration”. In the other, you select the ingredients and specify the constraints they must satisfy, such as a minimum amount of protein or a maximum amount of wheat, and MIXIT-WIN uses linear programming to select the ingredient amounts that satisfy these constraints; this is a least-cost or “balanced ration”.

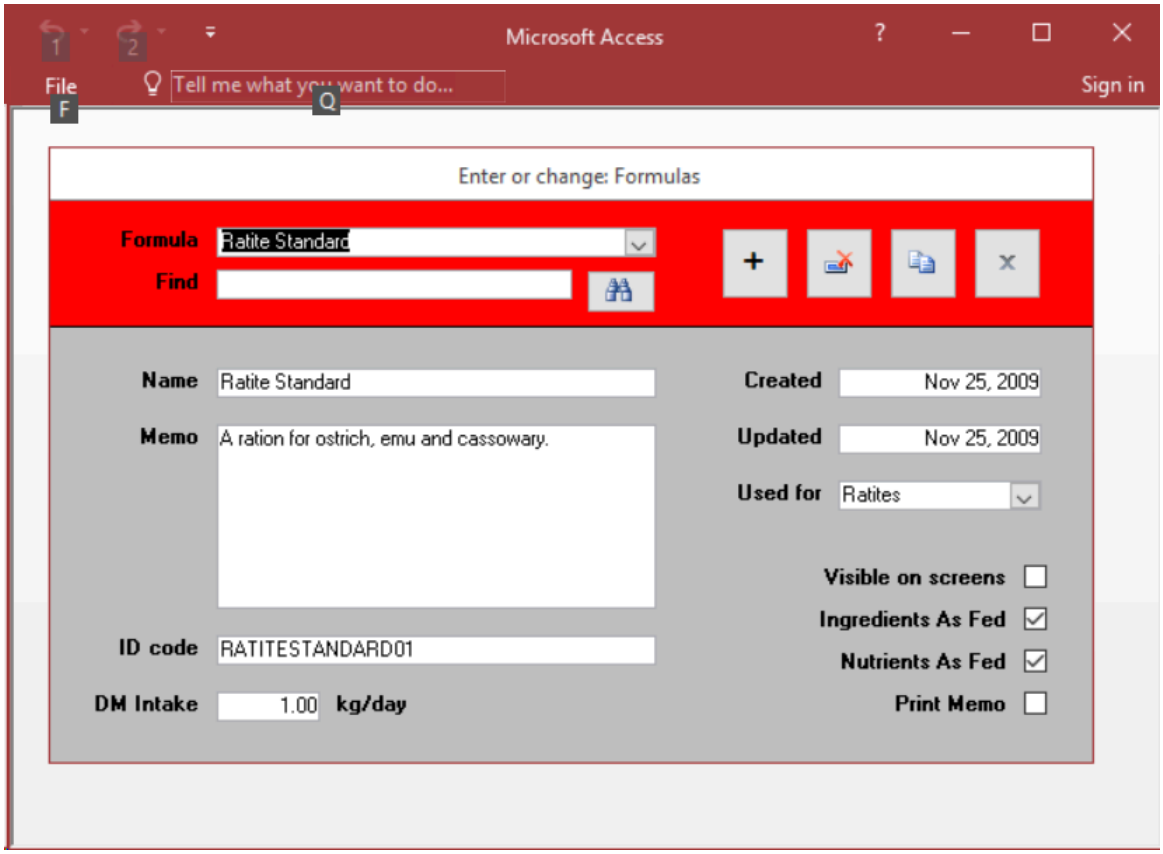
Formulas
MIXIT-WIN stores rations in containers called “formulas”. A single formula is a collection of many things, including names, dates, intake, and two rations: a current ration and a balanced ration. The current ration of a formula can be a hand-entered ration or a copy of an earlier balanced ration. You should think of the current ration as the ration you will produce, and the balanced ration as a temporary or experimental ration that may be a future production ration. Each formula contains:

- A Current Ration (A hand-entered or balanced ration for production.)
- A Balanced Ration (A temporary ration which may be saved as the current ration.)

- Other Data (Name. memo, intake, usage, dates, ID code and visibility.)

The following topics describe how to make a formula, make balanced and current rations, and print these rations.

Selecting formulas



To make a new formula or change an existing formula, click the Formulas button in the main menu of MIXIT-WIN and the Formulas window appears. This window has a drop-down box, a find box, four buttons including an Exit button, and boxes in which you enter or change the formula name, memo, dry matter intake, dates, ID code, usage, and visibility.

To select a formula, click the small down arrow at the right side of the formula drop-down box, and click the formula name. To add a new formula, click the Add button, which is the button with the plus sign (+).

Deleting a formula

To delete a formula, first select the formula from the formula drop-down box, and then click the Delete button, which is the button with the symbol X. The Delete button permanently removes the formula from the database. Instead, you can make the formula invisible, as explained next.

Visibility
Check the ‘Visible on screens’ box if you want this formula to appear in other windows and in printed reports. You should clear (un-check) the ‘Visible on screens’ box of a formula that you are not using, but may use or look at in the future. If you clear the Visible on screen box, this formula will only appear in this window (the Formulas window.)

Copying a formula
To copy the selected formula to a new formula, click the Copy button (the button with two sheets.) The Copy button copies the selected formula to a new formula that has the same name as the copied formula with the added word "(COPY)".

Formula names and memos

Formula names
After selecting a formula, click the name box and enter or change the formula name. A formula name has 1 to 64 characters, which can be letters, numbers or other symbols including spaces. Formula names are displayed alphabetically in drop-down boxes and other lists, and you will find it convenient to group related formulas by giving them names that start with the same letters; for example, “Horse feed 1” and “Horse feed for J.B. Farm.” See the topic “Suggestions for naming your formulas.”

Printing formula names and ID codes
To print formula names, from main menu click the Edit This Formula button, the Print button (the button with the printer), and the Formulas tab. Click the Select all button and (optionally) the Prices box, and click the Print button.

Formula memos
Click the Memo box and enter a comment about this formula. The comment can be long. If the Print Memo box is checked, this comment will appear at the bottom of printed reports of the current and balanced ration of this formula. If the Print Memo box is cleared (unchecked), this comment is only for your information.

DM intake, dates, ID Codes and Used for

DM intake
Click the DM intake box and enter the dry matter intake (DMI) of the animal. Enter 0 if you are not using the daily amounts of this ration. (See “Nutrient units and daily units explained” in Nutrients Help.)

Dates
The date when a formula is created and updated is changed automatically by MIXIT-WIN. You can change either date by clicking the box and entering a new date.

Used for
The Used for box selects the type of the formula, which is ‘beef cattle’, ‘poultry’, ‘premixes’, and so forth. The type of a formula determines the nutrients that appear in the drop-down boxes, in nutrient tables, and in printed reports of the current and balanced rations of the formula. Select an item in this box in order to see only those nutrients that apply to formulas of this formula type. (See “Formula types tell which nutrients are visible” and “Changing formula types” in Nutrients Help.)

Print Memo
If the Print Memo box is checked, everything in the Memo box will appear at the bottom of printed reports of the current and balanced ration of this formula. (See “Edit This Formula: Printing the current ration” and “Balance This Formula: Printing the balanced ration”.)

ID codes
An ID code is a 16-character name, consisting of letters A-Z and numbers 0-9, which identifies the formula. Different formulas should have different ID codes. ID codes are used to transfer formulas between databases (see “Sending and receiving formulas” in Options Help) and to communicate with feed mill control systems (see “Working with a feed mill” in InterFace Help.) Formula ID codes are printed by clicking the Edit This Formula button, the Print button, the Formulas tab, and choosing Select all.

Ingredients and nutrients in balanced rations

The check boxes ‘Ingredients As Fed’ and ‘Nutrients As Fed’ are used in balancing a ration and refer to the minimum and maximum constraints of ingredients, nutrients, and ratios (see the section “Balance This Formula.”) The options that you select also determine the column headings ‘As Fed’ and ‘Dry M’ in the Balance window and on balanced ration reports.

For example
You can find a balanced ration that has 10% Protein on a dry matter basis or 10% Protein on an as fed basis, and these two rations are different. Nutritionists often balance rations with ingredients on an as fed basis and then select nutrients on a dry matter basis for cattle and sheep, and nutrients on an as fed basis for swine and poultry.

As fed boxes
Use the ‘Ingredients As Fed’ box to balance the minimum and maximum ingredient amounts of the ration on an as fed basis (box checked) or on a dry matter basis (box cleared.) Use the ‘Nutrients As Fed’ box to balance the minimum and maximum nutrient amounts of the ration on an as fed basis (box checked) or on a dry matter basis (box cleared.)

Suggestions for naming your formulas

A formula name has 1 to 64 letters, numbers or special characters, including spaces. Since you will eventually have hundreds of formula names, it is important to adopt a consistent naming convention that takes advantage of the fact that formula names appear in alphabetical order. Your naming convention can be as simple as beginning the name of a horse ration with the word Horse, or the name of a ration for customer Brown with the word Brown. You could also embed the word Horse or Brown in the formula name and use the Find button to find Horse or Brown formulas. (To understand find boxes see “Working in windows” in Exit Help.)

A comprehensive naming convention

Nutritional consultants may prefer the following multi-mill, multi-species, multi-type naming convention that uses fields of fixed length separated by periods. (Periods are selected so that the name fits in boxes and on reports.) For example, the name

em.do.b.gf.s.4000.m.rut.Blue Bird 40% Beef Supplement

describes a formula manufactured by Energy Mills for the customer John Doe; it is a beef grower & finisher supplement with 40% CP and 00% NPN in meal form with drugs Rumensin & Tylan and tag name Blue Bird 40% Beef Supplement. The nine fields of this example are defined below.

field 1, length 2, manufactured by mill: em=Energy Mills, ab=Abbot Mills, etc.
field 2, length 2, manufactured for customer: do=John Doe, fs=Frank Smith, etc.
field 3, length 1, species: b=Beef, d=Dairy, s=Swine, e=Equine, o=Sheep, etc.
field 4, length 2, production: st=starter, ge=gestation, gf=grower & finisher, etc.
field 5, length 1, feed type: c=complete feed, g=grain mix, s=supplement, b=base mix, etc.
field 6, length 4, CP/NPN level for feed types c, g, s: % crude protein (2 digits), % NPN (2 digits.)
field 6, length 4, Ca/P level for feed type b: % calcium (2 digits), % phosphorus (2 digits.)
field 7, length 1, form: b=block, c=cube, m=meal, p=pellet, t=texturized, etc.
field 8, length 3, drug: apl=Apralan, as7=AS 700, rut=Rumensin & Tylan, etc.
field 9, length 0 to 40: tag name (descriptive or non-descriptive.)

If one of the first eight fields is missing, enter tildes (~) and a period. In this way the formula names are grouped correctly when they are listed alphabetically. For example, if no drug is added, use

em.do.b.gf.s.4000.m.~~~.Blue Bird 40% Beef Supplement

Edit This Formula

The purpose of a feed formulation program is the creation of rations, and MIXIT-WIN lets you create two types of rations. In one type you select the ingredients and their amounts and MIXIT-WIN calculates the nutrient content and daily amounts of the ration; this is a hand-entered or “current ration.” In the other type, you specify constraints that the ration

must satisfy, such as a minimum amount of protein or a maximum amount of wheat, and MIXIT-WIN selects the ingredients that satisfy the constraints; this is a least-cost or “balanced ration.” The present section discusses the hand-entered or current ration of a formula; see “Balance This Formula” for a discussion of balanced, least-cost rations.

Current and balanced rations

MIXIT-WIN stores current rations and balanced rations in containers called formulas. Each formula has at most one current ration and one balanced ration, and may have neither. To create or change the current ration of a formula you must first create the formula (see “Formulas: Adding, changing or copying a formula.”) After you have created a formula, there are two ways to create or change the current ration of a formula.

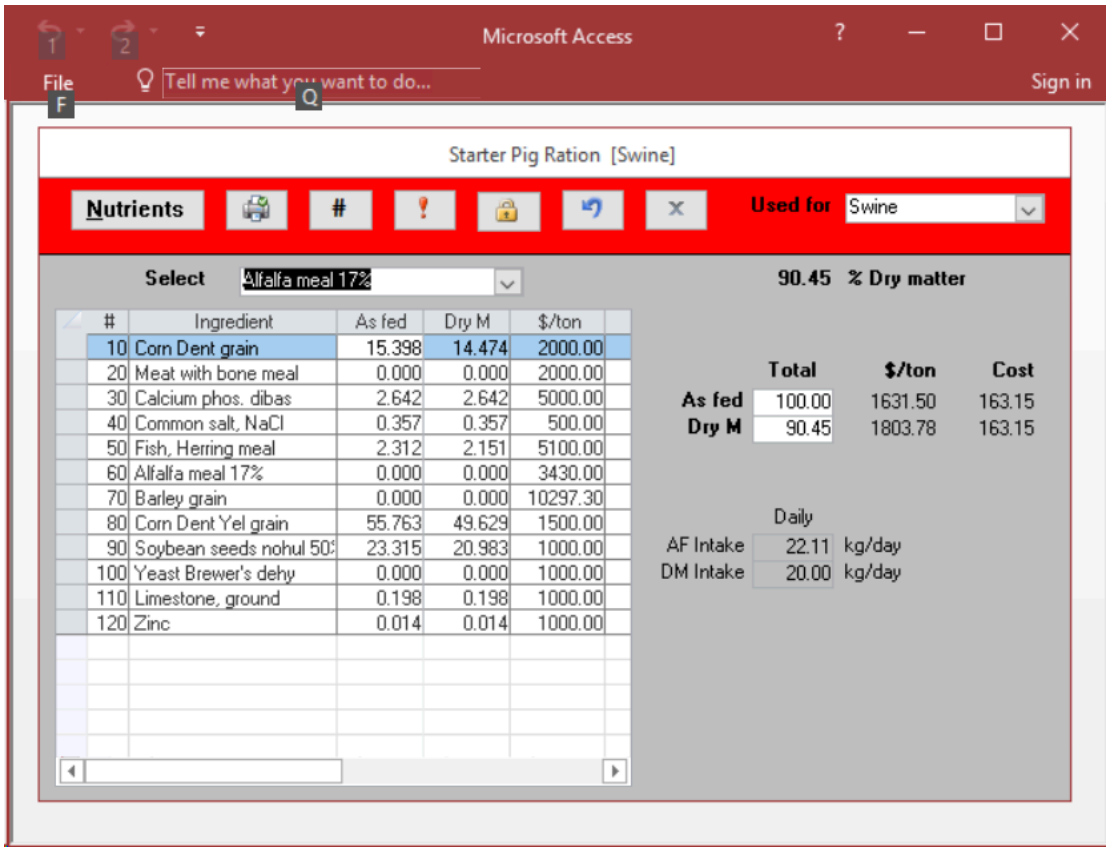
1. Select the formula name in the formula drop-down box of the main menu and click the Edit This Formula button.

2. Select the formula name in the formula drop-down box of the main menu and click the Balance This Formula button. Then create a balanced ration and click the Save button (see “Balance This Formula: Saving the balanced ration as the current ration.”)

The Edit window

After selecting a formula name in the formula drop-down box of the Main Menu, click the Edit This Formula button and the Edit window appears.

This window has buttons to show the nutrient content of the ration and print the ration, a drop-down box to select ingredients, and a table with a scroll bar to see and change ingredient amounts. Click the Exit button (X) to return to the main menu.



Tables of the Edit window
A table looks like a spreadsheet, with columns and rows, and can contain text and numerical data. The window that you use to edit rations has two tables: an ingredient table on the left and a nutrient table on the right. (Click the Nutrients button to see the nutrient table.)

Table columns
Each of these tables has a column of names, an As Fed column, a Dry Matter column, and other columns. You use the ingredient table to enter and change As Fed ingredient amounts, and the nutrient table to see the nutrient content of the ration. Column widths can be adjusted. These tables are explained in the following topics.

Working in the Edit window

Use the ingredient drop-down box (at the upper left) to select ingredients for the current ration. The ingredient that you select appears in the ingredient table, where you can change its sequence number (#), its as fed amount, or delete it from the table. (Sequence numbers are explained in the topic “Arranging the ingredients and comparing rations.”)

Deleting ingredients
You delete an ingredient from the table by clicking the gray box to the left of the name (this highlights the row) and then pressing the DELETE key on the computer keyboard. Since removing an ingredient from the table also removes it from the balanced ration of the formula, you may prefer to enter an As Fed amount of 0 instead of deleting it from the ingredient table.

Entering as fed amounts
Click the As Fed box to the right of the ingredient name and enter the as fed amount of the ingredient in the ration. You can also change the total as fed amount or total dry matter amount of the current ration, as explained below.

Changing total amounts
When you click the Nutrients button you see the nutrient table, and the Nutrients button becomes the Totals button. When you click the Totals button you see the weight and intake of the ration, and the Totals button becomes the Nutrients button. You can change the total as fed or dry matter weight of the current ration, and the as fed or dry matter intake of the ration. Just click a box and change its amount. The total weight of the ration determines the ingredients amounts that you see in the ingredient table and on several printed reports. The intake determines the daily amounts of the nutrients that you see in the nutrient table and on one printed report.

Sequence numbers
The first column of the ingredient table shows the sequence number (#) of each ingredient in the ration. Unlike nutrient sequence numbers, ingredient sequence numbers can be different for each ration, and determine the order in which the ingredients appear in the ingredient table and on printed reports. Click the sequence number (#) box to the left of the ingredient name and enter a sequence number. After you exit the Edit window, these sequence numbers are reset to 10, 20, 30, and so forth.

Arranging ingredients
The Arrange button (the button with the symbol #) arranges the ingredients by weight or by ID code. Click the Arrange button with the left mouse button (L click) to arrange the ingredients by decreasing weight; and click the Arrange button with the right mouse button (R click) to arrange the ingredients by increasing ID code. Arranging ingredients by ID code is useful if you always want ingredients to appear in a specific order on reports.

Comparing rations
Click the Formulas button (the button with the exclamation point !) to see other current rations. A window opens with a drop-down box from which you select a formula name. Click the title bar and drag this window to a convenient location.

Saving as an ingredient
Click the Save button (the button with a padlock) to save the formula as an ingredient. You can use the current formula price or enter a different price. To remove an ingredient, enter zero as the as fed amount of the ingredient before clicking the Save button. Afterwards, click the Undo button (the button with a curved arrow) to restore the as fed amounts. When a formula is saved as an ingredient, the long name of the ingredient has the formula name and the names and amounts of ingredients in the formula when these amounts are greater than zero.

The nutrient table

The nutrient table shows the nutrients that are used for the selected formula type, arranged by the sequence numbers of the nutrients. (See “Nutrients: Formula types tell which nutrients are visible” and “Nutrients: Sequence numbers arrange nutrients on reports” in Nutrients Help.)

Nutrients button and Totals button
Click the Nutrients button to see a table with the as fed and dry matter nutrient content of the current ration. This is the nutrient table, and the Nutrients button becomes the Totals button. When you enter a number in the As Fed box of the ingredient table, the nutrient table disappears and the Totals button becomes the Nutrients button again.

Resizing the tables

Click in the nutrient table to see daily amounts. Click in the ingredient table to restore its original size. Column widths can be adjusted.

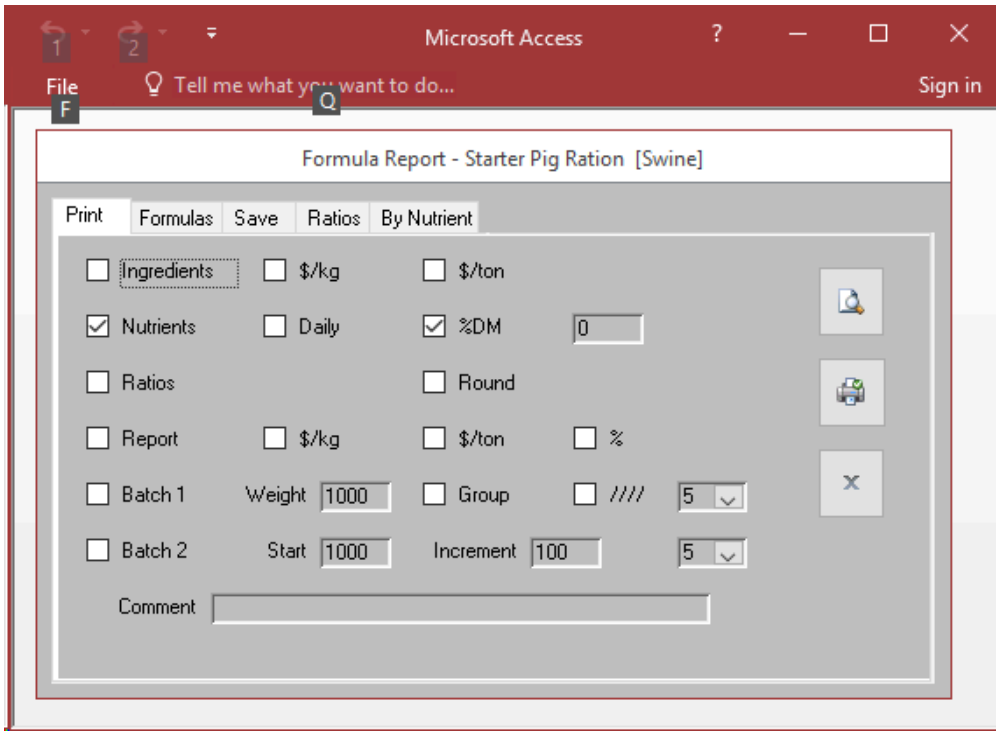
Formula types
The ‘Used for’ drop-down box temporarily changes the formula type of the formula so you can see and print other nutrients. The original formula type of the formula is restored when you click the Exit button.

The nutrient content of a ration
Each ration has a nutrient content that is an average of the nutrient contents of the individual ingredients in the ration. The nutrient content can be described on an as fed basis or a dry matter basis. The as fed amount of a nutrient in a ration cannot exceed its dry matter amount.

The daily amount of a nutrient
The daily amount of a nutrient is the number of kilograms or pounds of the nutrient that an animal requires or consumes in one day. The daily amount that is consumed depends on the nutrient content of the ration as well as the dry matter intake of the animal (see “Nutrients: Nutrient units and daily units explained” and “Nutrients: Selecting nutrient units and daily units” in Nutrients Help.)

Dry matter intake
After you enter a dry matter intake for the formula, MIXIT-WIN calculates the daily amount of each nutrient. You can ignore the daily amounts of a ration by entering 0 as the dry matter intake of the formula.

The Print button - Reports from the edit window



After selecting a formula name in the formula drop-down box of the main menu and clicking the Edit This Formula button, click the Print button (the button with the computer printer) to print the current ration, print multiple rations, save the current ration to a disk file, print a list of formula names and ID codes, see nutrient ratios, and find how much each ingredient in the current ration contributes to a selected nutrient.

Ration reports

The current ration of a formula can be printed in many ways. You can print simple ingredient, nutrient and ratio reports, a nutritionist's work report, a mill operator's batch weight report, a multi-column batch and scale weight report, and a multi-formula report with or without nutrients. Some reports show prices, others show ingredient percentages or rounded ingredient amounts, and others print nutrients with a selected dry matter percentage or with daily amounts.

Printing the current ration

After clicking the Print button in the Edit window, select the Print tab to print different reports. The six types of reports are selected on the six rows of the Print tab. Check the Ingredients box in the first row for an ingredient report showing the as fed amounts of ingredients with or without prices (in $/unit or $/ton.) Check the Nutrients box in the second row for a report showing as fed and dry matter nutrient amounts. You see the daily nutrient amount if you check the Daily box, or the nutrients with a selected dry

matter % if you check the %DM box and enter a percentage in the box at the right (this shows the as fed nutrient content of a ration that is dryer or wetter than the current ration.)

Ratios and rounding

Check the Ratios box in the third row for a report showing the nutrient ratios. Check the Round box to round the as fed ingredient amounts of all reports on the Print tab by the ingredient rounding numbers. To change the rounding numbers of ingredients, click the Ingredients button in the main menu. (An ingredient rounding number is used to round an ingredient amount to a specified precision. For example, the rounding number 0.01 rounds to the nearest 1/100 LB or KG; the number 5 rounds to the nearest 5 LB or KG.)

A simple report

Check the Report box in the fourth row for a compact report of the as fed and dry matter amounts of ingredients and nutrients in the ration. Check the % box to see as fed and dry matter percentages of ingredients, and check the $/unit or $/ton box to see as fed prices. If you want a report with a different total weight, click the Exit button and change the total as fed or dry matter amounts of ingredients in the ration.

Comments

The comments you enter in the comment box will be printed at the bottom of the report. After changing the comments, you are asked if you want to save the changes. Answer “Yes” to make them permanent and “No” to make them temporary. Comments appear on all reports of the Print tab. To the right of the Comment box is a Memo box. If you check this box, the formula’s memo will be printed at the bottom of the report below the comments. This is a way to put comments on a report such as cautions or instructions that are different for each formula. (See “Formulas: Formula names and memos.”)

Printing batch weights

Feed mill report

Check the Batch 1 box in the fifth row for a production batch sheet for the mill operator. Enter the total weight in the Weight box, and check the Group box to see ingredients grouped by ingredient type such as ‘bulk’ or ‘liquid’ (see “Ingredients: Ingredient groups on batch weight reports” in Ingredients Help.) Check the ‘////’ box for an alternating gray and white background for Batch 1 and Batch 2 reports, and select 1 to 15 comments in the drop-down comments box.

Multi-column report

Check the Batch 2 box in the sixth row for a multi-column batch and scale weight report. Enter the starting weight in the Start box, the weight increment in the Increment box, and 5, 10, 15 or 20 columns of weights in the drop-down columns box. The batch weight column shows ingredients amounts in the ration, which are rounded when the Round box is checked. The scale weight column shows the subtotals of the batch weight column that accumulate on a weighing scale.

Number of animals

Batch 2 can also show batch and scale weights according to the number of animals you are feeding. This report uses boxes in the fifth and sixth rows. For example, suppose you feed 100 to 290 cows (in increments of 10 cows) and each cow consumes 18 pounds of feed. Check the Batch 2 box and enter Start 100, Increment 10, and columns 20. On the row above, enter 18 in the Weight box, and check the Units box. With a check mark in the Units box, each batch weight column of the report shows the number of animals at the top of the column and the amount to feed them at the bottom.

Removing ingredients

In both Batch 1 and Batch 2 reports, an ingredient is not printed if its amount is zero or its sequence number is zero. Setting the ingredient sequence number to zero will temporarily remove an ingredient from the batch report. This is an easy way to calculate mixing instructions for protein or mineral supplements. (See “Edit This Formula: Arranging the ingredients and comparing rations.”)

Printing multiple formula reports

Select the Formulas tab. The formula names together with their total as fed amounts are listed on the left side of the window. Select or deselect formulas in the box by clicking them with the mouse. Formulas are printed in the order they are clicked in the box. You can also move through the list with the UP and DOWN arrow keys and select or deselect formulas with the SPACEBAR.

With ingredients
The ‘Column 1-12’ option previews or prints as fed ingredient amounts of 1 to 12 selected formulas with or without prices. Check the ‘Amount’ box and enter the total as fed amount of each formula, or clear the ‘Amount’ box to use the previously selected total amount of each formula. Check the ‘//////’ box for an alternating gray and white background.

With ingredients and nutrients
The ‘Column 1-8’ option is similar to the ‘Column 1-12’ option, except this option previews or prints 1 to 8 formulas together with their nutrient amounts. Check the Nutrients As Fed box to see the nutrients on an as fed basis, or clear this box to see nutrients on a dry matter basis. Use the ‘Amount’, ‘Prices’ and ‘//////’ boxes as described above for the ‘Column 1-12’ option. You will only see the nutrients displayed in the “Used for” box of the Edit This Formula window.

Options
The ‘Select all’ option prints a list of all formula names with dates when they were updated and their ID codes. Use the ‘Prices’ and ‘//////’ boxes as described above.

Reports
The ‘Report 1-12’ option prints the reports that you selected in the Print tab for up to 12 formulas that you select in the list of formulas; this option is disabled (grayed out) if you did not make a selection in the Print tab. (Only the first selected formula is previewed.)

Other print tabs

Save tab - Saving the current ration to a disk file
Select the Save tab. In the list box, click Text file to save the ration as a file that can be seen in Microsoft NotePad, click Word file to save a file that can be opened in Microsoft Word, or click Web file to save a file that can be opened in Internet Explorer. In the Path box, enter the location of the saved file.

AutoStart
If the AutoStart box is checked, clicking the OK button saves the file and automatically opens it in NotePad, Word, Explorer or Excel.

Microsoft Excel

If formulas are selected in the Formulas tab the multiple formula report can also be saved to a Microsoft Excel file; otherwise, the report that was selected in the Print tab will be saved.

For example
Enter C:\Program Files\MixitWn6 in the Path box to save the file to the folder MixitWn6 which is under the folder Program Files on drive C. In the Name box, enter the name of the file that will be saved. Click the OK button to save the file.

Ratios tab - Viewing ratios
Select the Ratios tab to see ratios of the nutrients that you previously selected in the Balance window. (See “Balance This Formula: The ratio table.”)

By Nutrient tab - Where do the nutrients come from?
Select the By Nutrient tab. Select a nutrient from the drop-down box on the left and you will see how much each ingredient in the formula contributes to the nutrient that you selected. This is useful if a nutrient amount is unusually large and you want to see the sources of this nutrient.

Balance This Formula

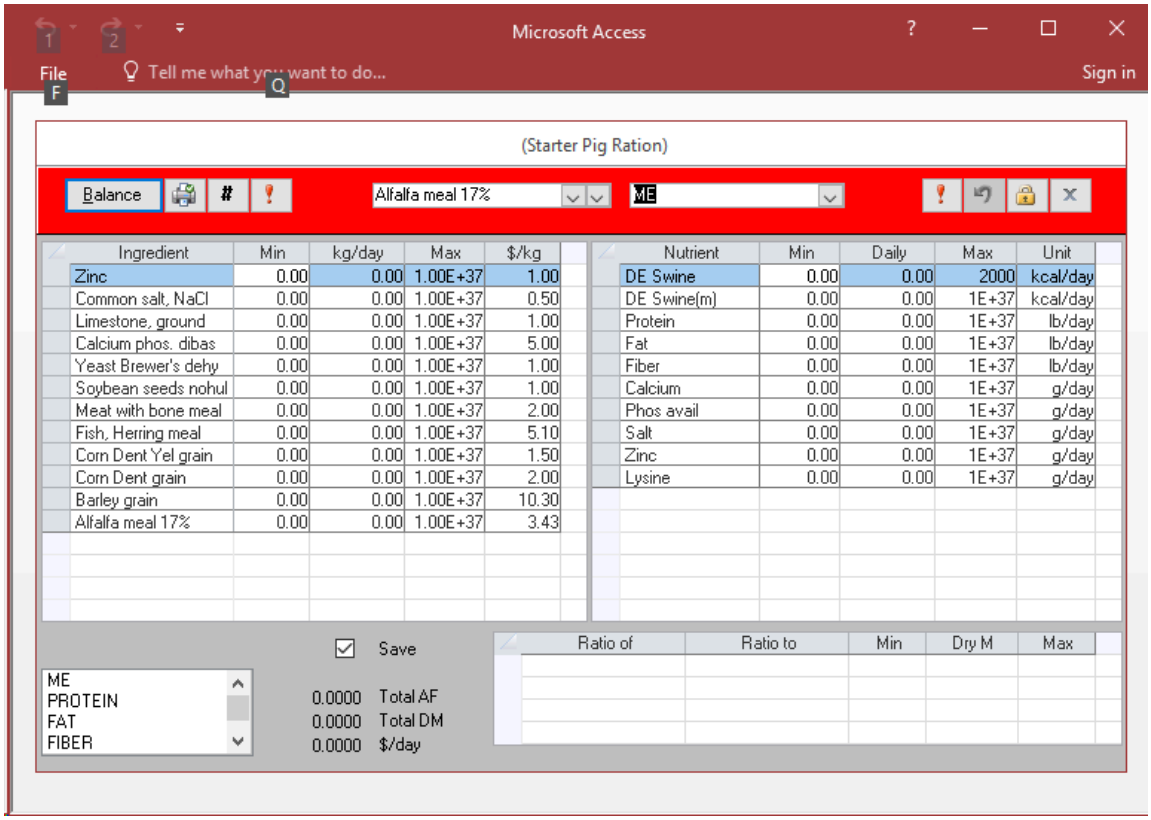
You often want a ration that satisfies minimum or maximum conditions, such as ‘at least 12% Protein’ or ‘at most 5% Wheat’. A ration that satisfies all of its minimum and maximum conditions is called a ‘balanced ration’. MIXIT-WIN uses linear programming to find the ingredient amounts that satisfy the minimum and maximum conditions you place on selected ingredients, nutrients, and nutrient ratios. (For the details of ration balancing by computer, click the help button next the Exit button in the startup menu and display “Computer feed formulation”.)

Least cost rations
A balanced ration is not always possible. For example, you may ask for a ration with 20% energy, but select ingredients that individually contain less than that amount of energy. (If a balanced ration is not possible, MIXIT-WIN offers helpful suggestions.) When a balanced ration is possible, however, many different rations will also satisfy the same conditions and MIXIT-WIN must choose one of them. In this case, MIXIT-WIN chooses a least-cost balanced ration; that is, a ration with the property that no other balanced ration has a lower as fed price per ton with respect to the current ingredient prices.

As fed and dry matter prices

The as fed price of a ration cannot exceed its dry matter price; the relationship between these prices is given by Q = 100 P / D, where P = as fed price, Q = dry matter price and D = dry matter %. MIXIT-WIN uses linear programming to minimize the as fed price of a ration. When balancing a ration you will usually see P and Q increase or decrease together. Sometimes, however, you may see P increase and Q decrease (in this case D increased more than P did); or you may see P decrease and Q increase (in this case D decreased more the P did.)

The Balance window



Overview

MIXIT-WIN stores rations in containers called ‘formulas’. To find a balanced ration you must first create a formula (see the topic “Formulas: Selecting formulas.”) Then select the formula name from the formula drop-down box of the main menu, click the Balance This Formula button and the Balance window appears.

This window has buttons to calculate and print rations, drop-down boxes for selecting ingredients and nutrients, and tables with scroll bars in which you enter constraints and see the resulting balanced ration. For information about drop-down boxes, tables and

scroll bars see “Working in windows” in Exit Help. Hold the mouse pointer over a button for a brief description.

Buttons of the Balance window

- The Balance button is used to find balanced, least cost rations (see “Balancing a ration”).
- The Print button (a printer) will print, save and factor rations (see “Printing a balanced ration” and “Factoring the constraints”).
- The Daily button (!) uses daily intake in balancing a ration (see “Balancing a ration using daily intake”).
- The Diff button (<<) shows how a ration changes after pressing the Balance button (see “Seeing the difference between two rations”).
- The Excel button (x) is explained in the section “Excel formulas.”
- The Undo button (a curved arrow) restores the previous ration (see “Restoring the previous ration”).
- The Save button (a padlock) is explained in “Saving the balanced ration as the current ration”.
- Click the Exit button (X) or press the Esc key to return to the main menu.

Tables of the Balance window

A table looks like a spreadsheet, with columns and rows, and contains text and numerical data. The window that you use to balance rations has three tables: an ingredient table on the left, a nutrient table on the right, and a ratio table at the bottom. Each of these tables has one or two columns of names, a minimum column, an amount column, a maximum column, and a cost column. The ingredient table also has three price columns, which you can see by clicking the scroll bar at the bottom of the table. Column widths can be adjusted.

Entering ingredients and nutrients

Before balancing a ration, you enter (into the ingredient table) the ingredients that MIXIT-WIN can pick from in finding a balanced ration. You also enter the nutrients you will constrain into the nutrients table, and (optionally) the nutrient ratios into the ratio table.

Deleting table items

You can remove ingredients, nutrients, and ratios from the tables. You remove an item from a table by clicking the gray box to the left of the name (this highlights the row) and then pressing the DELETE key on the computer keyboard.

The ingredient table

Use the ingredient drop-down box (at the upper left) to select ingredients for this ration. There is no limit to the number of ingredients you can select. Using many ingredients makes it easier to find a balanced ration, and reduces its price. After you have selected an ingredient, you can change its minimum or maximum % in the ration and its current

price. Click the Min box to the right of the ingredient name and enter the minimum % of the ingredient in the ration. Click the Max box to the right of the ingredient and enter the maximum % of the ingredient in the ration.

The ingredient drop-down box

Click the down arrow to the right of the ingredient drop-down box. You will see a column of ingredient names and a column of nutrient prices. The nutrient prices belong to the nutrient that is selected in the nutrient drop-down box (described later). The price of a nutrient is the cost of one unit of the nutrient. Ingredients with small nutrient prices are usually the most economical ingredients to select for a formula. (To learn more about nutrient prices click the help button next to the Exit button in the startup menu and see “Computer feed formulation => Basic concepts => Nutrient prices”.)

Sorting ingredients

At the right of the ingredient drop-down box is a small Sort by button (a down arrow) that determines how the ingredients are displayed in the ingredient drop-down box. Click the Sort by button to arrange the ingredients alphabetically by name, or numerically by nutrient price. For example, to find ingredients with Calcium, select Calcium in the nutrient drop-down box (to the right of the ingredient drop-down box), click the Sort by button and select “Nutrient price”, and open the ingredient drop-down box. You will see the ingredients arranged according to increasing nutrient prices of Calcium (i.e., the most economical Calcium ingredients appear first in the list).

Changing prices

You can click the Price box (the box with $/lb, $/cwt, $/kg or $/ton) in the ingredient table to the right of the ingredient name and change the current price of the ingredient. Since a balanced ration is also a least-cost ration, you can change the price of an ingredient in order to control how much of the ingredient will be included in the balanced ration. For example, give a forage ingredient the price of $0.00/lb, and the balanced ration will use as much as possible of the forage; or give a premix ingredient a high price like $9999/lb, and the balanced ration will have as little as possible of the premix. Deleting an ingredient from the ingredient table also removes it from the current ration of the formula. You can give an ingredient a high temporary price instead of deleting it from the table.

Minimums and maximums

Enter a minimum % of 0 if you do not want a minimum constraint on the ingredient, and a maximum % of 100 if you do not want a maximum constraint. Use as few constraints as possible, because each constraint you enter can make the ration more expensive.

As fed or dry matter

Between the Min box and the Max box of the ingredient table is an amount box. The amount box has the name ‘As fed’, and the ingredients are constrained on an as fed basis, if you checked the ‘Ingredients As Fed’ box when you created this formula. The amount box has the name ‘Dry M’, and the ingredients are constrained on a dry matter

basis, if you cleared the ‘Ingredients As Fed’ box when you created this formula (see the earlier topic “Ingredients and nutrients in balanced rations.”)

The nutrient table

Use the nutrient drop-down box (at the upper right) to select nutrients for this ration. There is no limit to the number of nutrients you can select. After you have selected a nutrient, you can change its minimum or maximum amount in the ration. Click the Min box to the right of the nutrient name and enter the minimum amount of the nutrient in the ration. Click the Max box to the right of the nutrient and enter the maximum amount of the nutrient in the ration. The number that you enter depends on the nutrient unit, which you can see when you open the nutrient drop-down box. For example, if the nutrient unit is mcal/kg, then the minimum and maximum amounts are the minimum and maximum mcal/kg of this nutrient in the balanced ration.

Showing nutrients

When you use the nutrient selection box to select nutrients for this ration, you will see nutrients, arranged by sequence number, that are visible and used in this formula. If you cannot find the nutrient that you want in the drop-down nutrient selection box, make sure the nutrient is visible and is used for the formula type of the ration (see “Sequence numbers arrange nutrients on reports” and “Formula types tell which nutrients are visible” in Nutrients Help.)

Minimums and maximums

Enter a minimum amount of 0 if you do not want a minimum constraint on the nutrient, and a maximum amount of 1E+37 if you do not want a maximum constraint. The number 1E+37, which is scientific notation for 1 followed by 37 zeros, is used as "infinity" or "none" in MIXIT-WIN. When 1E+37 appears as the maximum amount of a nutrient or ratio constraint, MIXIT-WIN assumes that the constraint has no maximum amount. Use as few constraints as possible because each constraint you enter can make the ration more expensive.

As fed or dry matter

Between the Min box and the Max box of the nutrient table and the ratio table is an amount box. The amount box has the name ‘As fed’ and the nutrients are constrained on an as fed basis if you checked the ‘Nutrients As Fed’ box when you created this formula. The amount box has the name ‘Dry M’, and the nutrients are constrained on a dry matter basis, if you cleared the ‘Nutrients As Fed’ box when you created this formula (see the earlier topic “Ingredients and nutrients in balanced rations.”)

Least-cost rations

MIXIT-WIN uses a simple linear programming procedure to minimize the cost of a ration. MIXIT-WIN minimizes the as fed price of a ration when the ‘
Nutrients as fed’ box is checked, and minimizes the dry matter price of a ration when the ‘Nutrients as fed’ box is cleared. This is the most economical way to feed animals with

fixed intake. (For more information, click the help button next the Exit button in the startup menu, select “Computer feed formulation”, and see “Feeding animals with fixed intake”.)

Viewing or restricting
You use nutrients in two ways: for viewing and for restricting. You view a nutrient by selecting the nutrient and making no change in its minimum amount (0) and maximum amount (1E+37). Or, you can select a nutrient and change its minimum or maximum amount in order to restrict and view this nutrient in the ration.

The ratio table

To enter a ratio of nutrients you use the box to the left of the ratio table. Click the first nutrient in the ratio and then click the second nutrient. The ratio of these two nutrients appears in the ratio table at the bottom of the window.

Minimums and maximums
After you have selected a nutrient ratio, you can change its minimum or maximum amount in the ration. Click the Min box to the right of the name and enter the minimum amount of the nutrient ratio in the ration. Click the Max box to the right of the name and enter the maximum amount of the nutrient ratio in the ration. Enter a minimum amount of 0 if you do not want a minimum constraint on the nutrient ratio, and a maximum amount of 1E+37 if you do not want a maximum constraint.

Viewing or restricting
You use nutrient ratios in two ways: for viewing and for restricting. You view a nutrient ratio by selecting the two nutrients and keeping the minimum amount 0 and maximum amount 1E+37. Or, you can select a nutrient ratio and change its minimum or maximum amount in order to restrict and view this ratio in the ration.

Ratios of the current ration
When the balanced ration is saved as the current ration, these ratios become the ratios of the current ration (see the topics “Saving the balanced ration as the current ration” and “See the nutrient ratios of the balanced ration.”)

Balancing a ration

To find a balanced ration, enter ingredients, nutrients and (optionally) ratios into the three tables, with as few minimum and maximum constraints as practical. Then click the Balance button. The amount columns of the three tables (with names As fed or Dry M) are filled with numbers. If these numbers are not all zero, this is a balanced ration, and the amount column of the ingredient table shows the balanced ration.

The easiest ration for the computer to balance is one that has many ingredients, with all ingredient minimums = 0 and all ingredient maximums = 100; and not many nutrients,

with no nutrient having both a minimum > 0 and a maximum < 1E+37. While it is not always possible to use such a simple ration, this is the ideal that should be kept in mind when entering ingredient and nutrient constraints. In particular, it is usually a bad idea to have a constraint where the minimum equals the maximum.

Error messages
After finding a balanced ration, MIXIT-WIN may report that an ingredient, nutrient or ratio amount is slightly below its minimum constraint or slightly above its maximum constraint. In this case, visually check the constraints for errors before using the ration, and try to simplify the formula by removing unnecessary constraints.

A shortcut
When you enter a number in the minimum or maximum box of one of the three tables, you can immediately press the ENTER key on the computer keyboard. Pressing the ENTER key is the same as clicking the Balance button.

MIXIT-WIN finds a balanced, least-cost ration by linear programming and displays the costs of ingredient and nutrient constraints and the ranges of ingredients prices. Constraint costs and price ranges are explained in the next topic.

Constraint costs and price ranges

Binding constraints
A ‘binding’ ingredient or nutrient constraint is a minimum or maximum constraint in which the actual amount of the ingredient or nutrient equals the minimum or maximum amount. Every binding constraint has a cost, which is the amount by which the total cost of the ration changes for every unit that is changed in the binding constraint.

Constraint costs
The cost of a binding constraint is shown in the ‘Cost’ box to the right of the name box in each of the three tables. In practical terms, a constraint with a high cost significantly increases the price of the ration, and should be examined. For example, if you have a balanced ration that has a high cost of the nutrient Phosphorus, try to include cheaper sources of phosphorus in the ingredient table.

Price ranges
The ingredient table has a Low column and a High column showing the low price and high price of each ingredient. If the current price of an ingredient is changed to a price that is below the low price or above the high price, and you click the Balance button, a new, balanced, least-cost ration will be produced. If the price of an ingredient is changed to a price within the price range, there will be no change in the composition of the ration, although its price will change.

The previous statements are correct only when a single price is changed. Anything can happen if two or more prices are changed. The price range of an ingredient shows you how much the price of a single ingredient can vary without changing the balanced ration.

Getting help when a ration does not balance

To find a balanced ration you click the Balance button or press the ENTER key, and the amount columns of the three tables are filled with numbers. If these numbers are all zero, a balanced ration cannot be found with these ingredients and constraints, and the Balance button turns into a Help button. Click the Help button (or press the ENTER key) for specific help in balancing the ration, such as “Lower the minimum of Protein to 7.896, or include ingredients high in Protein.”

General suggestions
The following suggestions apply to all rations that do not balance; that is, to all rations whose (constrained) ingredients are not able to satisfy the nutrient and ratio constraints. When the ration does not balance:

-- Include more ingredients in the ration.
-- Remove all minimum and maximum ingredient constraints.
-- Don’t use both a minimum and maximum constraint for the same nutrient.
-- Lower the minimum nutrient constraints; raise the maximum nutrient constraints.

A good way
Instead of entering a large number of constraints before clicking the Balance button it is better to enter a few constraints, click the Balance button, enter a few more constraints, click the Balance button, and so forth.

Balancing a ration using daily intake

When you click the Balance This Formula button, the Balance window opens. The button at the top of the Balance window to the right of the Print button is the Daily (!) button. Clicking this button opens the Daily window.

At the top of the Daily window are an AF Intake box and a DM Intake box. If the nutrients in the Balance window are restricted on an as fed basis, enter the animal’s daily as fed intake in the AF Intake box. If the nutrients are restricted on a dry matter basis, enter the animal’s daily dry matter intake in the DM Intake box. If the daily amount of a nutrient is zero, exit from the Balance window; in the main menu click the Nutrients button, select the nutrient, and select a nutrient unit from the units list (see “Selecting nutrient units and daily units” in Nutrients Help.)

The Daily table has a Minimum column and a Maximum column. These are the same as the Min and Max columns of the nutrient table in the Balance window. To the right of the Minimum column is the minimum Daily column; to the right of the Maximum column is

the maximum Daily column. The minimum and maximum Daily columns show the minimum and maximum daily amounts of the nutrients that are in the daily amount of the formula shown in the AF Intake and DM Intake boxes.

The Daily window provides more than just information. You can use the Daily window to change numbers in the four numeric columns of the Daily table and in the Min and Max columns of the nutrient table by clicking cells in the Minimum and Maximum columns and entering new daily amounts.

For example, click the cells in the Minimum column and enter the animal's minimum daily requirements. This will change the minimum nutrient restrictions in the Balance window and produce a formula that meets these minimum daily requirements of the animal when it consumes the amount shown in the AF Intake or DM Intake box.

The Daily(!) button can be used in requirement feeding. After starting Mixit-Win, right-click the Balance This Formula button to open the Requirement window. Then press the F1 function key to read about requirement feeding.

The print button - save a ration to file, multiply by a factor

Printing a balanced ration

Click the Print button (the button with a computer printer) and a window opens. Select the Print tab to see or print the balanced ration. Click the Preview button or the Print button to see or print the ingredients with amounts, constraints, prices and costs, and the nutrients and nutrient ratios with constraints, amounts and costs.

You will only see the nutrients that you selected for the formula type of the ration and which are visible on reports (see "Formula types tell which nutrients are visible" in Nutrients Help.)

The Total amount of the of the formula is the "Units per ton" number (usually 1000 or 2000) that you select by clicking the Options button in the main window of Mixit-Win.

Saving a balanced ration to a disk file

Click the Print button (the button with a computer printer) and a window opens. Select the Save tab to save the balanced ration to a disk file. In the list box, click Text file to save the ration as a file that can be seen in Microsoft NotePad, or click Rich Text Format file to save the ration as a file that can be opened in Microsoft Word. In the Path box, enter the location of the saved file.

For example, enter A: to save to a disk in drive A, or C:\Program Files\MIXITWn3 to save to the folder MIXITWn3 which is under the folder Program Files on drive C. In the Name box, enter the name of the file that will be saved. Click the OK button to save the file. If the AutoStart box is checked, clicking the OK button saves the file and automatically

opens it in NotePad, if Text file was selected, or in Word, if Rich Text Format file was selected.

The Factor tabs
Click the Print button (the button with a computer printer) and a window opens. Click the Factor 1 tab to factor ingredient constraints, the Factor 2 tab to factor nutrient constraints, and the Factor 3 tab to factor ratio constraints.

Each factor tab shows a list of names, a minimum box, a maximum box and three buttons: OK, Undo and Exit. Select the names in the list that you want to factor. Then enter a number to 'Multiply Minimum by', enter a number to "Multiply Maximum by', and click the OK button. Click the Undo button to cancel this action.

Other tasks

Minimizing properties of a ration
A computer feed formulation program uses linear programming to select a ration of minimum cost that meets all of the feed and nutrient constraints. This is called a balanced, least-cost ration. The minimum cost depends on the current feed prices. These prices are the prices at which the feeds can be purchased, and the resulting balanced ration is a ration of minimum purchase price.

In a general sense, price is a property of a feed, just as density and electric charge are properties of a feed, and a feed formulation program can use linear programming to find balanced rations of minimum density or balanced rations of minimum electric charge.

You can minimize a feed property other than "purchase price" by setting the feed prices to the other property; for example, by setting feed prices to feed densities or electric charges. You can find balanced rations of maximum density or maximum electric charge by setting the feed prices to the negative feed densities or electric charges.

Seeing the difference between two rations
Between the Daily button and the ingredient drop-down box is the Diff button (the button with the left-pointing arrows <<.) This button turns one column of each table into a difference (<<) column that shows the difference between the amounts of this ration and the amounts of the previous ration. A difference is blue for an increase, red for a decrease, and blank for no change in the amount of the previous ration. Click the Diff button again to return to the earlier tables.

Comparing prices of the balanced and production rations
After clicking the Diff button and the Balance button, the title bar (at the top of the window) shows the as fed price per ton of the balanced ration and the production ration.

For example click the Diff button, then change any minimum or maximum constraint and click the Balance button. The difference columns will show which amounts increased (blue) and which decreased (red). The balanced and production as fed prices appear in the title bar.

Restoring the previous ration
The Undo button (the button with the curved arrow) restores the previous balanced ration, which is the balanced ration before you clicked the Balance button or pressed the ENTER key. You can restore up to four previous balanced rations as well as the last balanced ration. Repeatedly pressing the Undo button displays these five rations in turn.

Saving the balanced ration as the current ration
The ingredient amounts in the balanced ration are not necessarily the same as the ingredient amounts in the current ration. If you want this balanced ration to become the current ration of this formula, click the Save button (the button with a lock) to save the ingredient amounts in the balanced ration as the current ration. You can then change and print the current ration with the Edit This Formula button in the main menu (see the section “Edit This Formula.”)

Factoring the constraints
Ingredient constraints have minimums of 0% or larger and maximums of 100% or smaller. Nutrient and ratio constraints have minimums of 0 or larger and maximums of 1E+37 or smaller. MIXIT-WIN lets you select a set of ingredient, nutrient or ratio constraints and ‘factor’ this set of constraints by multiplying all minimums or maximums in the set by the same number or ‘factor’. For example, multiplying a set of minimum amounts by the factor 1.1 will increase all of the minimum amounts in this set by 10%.

Selecting multiple items
You select multiple items in a list box by holding down the SHIFT key and clicking them with the mouse or by holding down the SHIFT key and pressing an arrow key to extend the selection from the previously selected item to the current item. You can also select items by dragging with the mouse. Holding down the CTRL key and clicking an item selects or deselects that item.

OK button disabled
Multiplying a minimum amount by a factor has no effect if the minimum amount is 0. Similarly, multiplying a maximum amount by a factor has no effect if the maximum amount is 100% (for an ingredient) or 1E+37 (for a nutrient or nutrient ratio.) If your selection does not include an item whose minimum is greater than 0, or whose maximum is less than 100% or 1E+37, the OK button is disabled (grayed out.)

Requirement Feeding

A new feature of Mixit-Win is requirement feeding. After starting Mixit-Win, right-click the Balance This Formula button to open the Requirement window.

Requirement feeding is a procedure that uses linear programming to produce a least-cost ration based on the daily nutrient requirements of an animal. The result of requirement feeding is a ration R and an amount W so that the animal’s nutrient

requirements are met, at minimum cost, by consuming W pounds or kilograms of R every day. The ration R and the amount W are together called a least-cost requirement feed for the animal.

A least-cost requirement feed is not the same as a least-cost balanced ration. A least-cost balanced ration meets nutrient concentration restrictions such as “at least 6% protein”; a least-cost requirement feed meets nutrient requirement restrictions such as “at least 60 grams of protein”. A least-cost balanced ration meets ingredient percentage restrictions such as “at least 5% corn”; a least-cost requirement feed meets ingredient amount restrictions such as “at least 20 pounds of corn”. The amount of a least-cost balanced ration is often 100, 1000 or 2000 pounds or kilograms; the amount of a least-cost requirement feed is a number W that varies with the ration and the animal.

Requirement feeding is the most economical way of supplying an animal’s minimum daily requirements if the cost of the feed is the primary consideration. More information about requirement feeding is found by clicking the thin Help button to the right of the Exit button in the first MIXIT-WIN menu (the 10-button menu) and selecting Computer feed formulation: Requirement feeding.

Requirement feeding involves the daily values of nutrients. When you click the Edit This Formula button and then click the Nutrients button you will see the nutrient daily values for the formula. These daily values depend on the dry matter intake of the formula. If you increase or decrease the dry matter intake of the formula, the daily nutrient values of the formula will increase or decrease accordingly.

You change the dry matter intake of a formula by clicking the Formulas button, selecting the formula, and changing the number in the DM intake box. You can also change the dry matter intake by clicking the Edit This Formula button and changing the number in the AF Intake box or the DM Intake box.

The Requirement window

First select a formula in the MIXIT-WIN main menu. Then right-click the Balance This Formula button and the Requirement window opens. The Requirement window resembles the Balance window. The Requirement window, however, has different buttons and restricts ingredients and nutrients in a different way.

The Balance window and the Requirement window share the same ingredients, nutrients and ratios, but have different minimum and maximum values. Adding or deleting an ingredient, nutrient or ratio in one window will add or delete the same ingredient, nutrient or ratio in the other window.

The ingredient table of the Requirement window always restricts ingredients on an as fed basis, regardless of how ingredients are restricted in the Balance window. The nutrient table of the Requirement window restricts the nutrient quantities themselves. In both windows, the ratio table restricts ratios of nutrients in the nutrient table.

Click the Balance button to get a least-cost requirement feed and the Print (printer) button to print the least-cost requirement feed. Click the Save (padlock) button to save the least-cost requirement feed as the current ration, with the total ingredient amount becoming the as fed intake of the formula if the Save check box is checked.

Click the Weight (#) button to enter the dry matter intake if the nutrients are restricted on a dry matter basis, the as fed intake if the nutrients are restricted on an as fed basis, or zero to let the intake vary between 0 and 1E+37. Information about intake is found by clicking the thin Help button to the right of the Exit button in the first MIXIT-WIN menu (the 10-button menu) and selecting Computer feed formulation: Requirement feeding IV.

Two Change (!) buttons convert a least-cost balanced ration into a least-cost requirement feed by transferring ingredient restrictions, nutrient restrictions, and nutrient ratios from the Balance window to the Requirement window. This is explained later in the topic “The Change buttons”. The Undo (curved arrow) button restores the numbers changed by the right-most Change (!) button.

Requirement units

The units in the tables of the Requirement window are determined by your selection of intake and nutrient units for MIXIT-WIN.

The unit in the ingredient table is the intake unit of MIXIT-WIN. To change the intake unit, click the Options button in the MIXIT-WIN menu. Click the arrow to the right of the Intake unit box, and select “g/day”, “kg/day” or “lb/day”. You must exit the Options window, exit MIXIT-WIN and then reenter MIXIT-WIN for the new intake unit to be recognized.

The units in the nutrient table are the daily units of nutrients in MIXIT-WIN. To change the daily unit of a nutrient, click the Nutrients button in the MIXIT-WIN menu and select a nutrient from the Nutrient box at the top of the window. Then click the arrow to the right of the Select box and choose a nutrient unit and daily unit pair such as “% (g/day)” or “kcal/lb (kcal/day)”.

WARNING: Do not try to enter your own intake or nutrient units. You can only use the intake and nutrient units provided in the drop-down boxes of the Options and Nutrients windows. It is possible (but difficult) to change the intake and nutrient units of MIXIT-WIN. For more information, click the thin Help button to the right of the Options button and read the topics in “The daily factor table.”

Although various combinations of American and metric units may be used with requirement feeding, it is easiest to compare a least-cost requirement feed with a least-cost balanced ration if the units of MIXIT-WIN belong to one of the systems shown below.

1. The unit of weight is kg and the intake unit is kg/day.
   Each nutrient unit is Unit/kg, or % with daily unit of kg/day.

2. The unit of weight is lb and the intake unit is lb/day.
   Each nutrient unit is Unit/lb, or % with daily unit of lb/day.

The balanced ration method

When the minimum daily requirements of an animal are known, a common way of formulating a ration for the animal is to find a least-cost balanced ration that meets these minimum daily requirements when the animal consumes a fixed amount of the ration. The fixed amount is usually the as fed intake or dry matter intake of the animal.

This way of formulating rations, called “the balanced ration method”, can be summarized as follows: knowing the minimum daily requirements of an animal and the minimum daily intake of the animal, find a ration whose minimum nutrient restrictions satisfy the minimum daily requirements when the animal consumes the daily intake amount of the ration. The balanced ration method has four steps:

1. Find the animal’s minimum daily requirements.
2. Find the animal’s daily intake.
3. Using daily intake, convert each daily requirement into a minimum nutrient restriction.
4. Find a least-cost balanced ration.

An easy way to convert daily requirements into minimum restrictions in Step 3 above is to use the Daily (!) button in the Balance window (see the following section “The Daily button”). The balanced ration method is used in the section “Comparing balanced rations with requirement feeds”.

Another way of formulating rations, called “the requirement feed method”, can be summarized as follows: knowing the minimum daily requirements of an animal, find a ration and an amount W that satisfy the minimum daily requirements when the animal consumes W pounds or kilograms of the ration. The requirement feed method has two steps:

1. Find the animal’s minimum daily requirements.
2. Find a least-cost requirement feed.

The requirement feed method is the way rations are formulated in the Requirement window. It is also used in the section “Making the corresponding requirement feed”.

The Daily button

When you click the Balance This Formula button, the Balance window opens. The button at the top of the Balance window to the right of the Print button is the Daily (!) button. Clicking this button opens the Daily window.

At the top of the Daily window are an AF Intake box and a DM Intake box. If the nutrients in the Balance window are restricted on an as fed basis, enter the animal’s daily as fed intake in the AF Intake box. If the nutrients are restricted on a dry matter basis, enter the animal’s daily dry matter intake in the DM Intake box. If the daily amount of a nutrient is zero, exit from the Balance window; in the main menu click the Nutrients button, select the nutrient, and select a nutrient unit from the units list (see “Selecting nutrient units and daily units” in Nutrients Help.)

The Daily table has a Minimum column and a Maximum column. These are the same as the Min and Max columns of the nutrient table in the Balance window. To the right of the Minimum column is the minimum Daily column; to the right of the Maximum column is the maximum Daily column. The minimum and maximum Daily columns show the minimum and maximum daily amounts of the nutrients that are in the daily amount of the formula shown in the AF Intake and DM Intake boxes.

The daily window provides more than just information. You can use the Daily window to change numbers in the four numeric columns of the Daily table and in the Min and Max columns of the nutrient table by clicking cells in the Minimum and Maximum columns and entering new daily amounts.

For example, click the cells in the Minimum column and enter the animal’s minimum daily requirements. This will change the minimum nutrient restrictions in the Balance window and produce a formula that meets these minimum daily requirements of the animal when it consumes the amount shown in the AF Intake or DM Intake box. This is an easy way to get a formula by the balanced ration method.

The requirement feed method

The requirement feed method is the usual way rations are formulated in the Requirement window. Use the following steps to find a least-cost requirement feed for an animal.

Step 1
Find the animal’s minimum daily nutrient requirements and daily intake. The requirement unit should be the same as the daily unit of the nutrient. For example, if the daily unit of

protein is g/day, then the requirement unit of protein should be g/day; if the daily unit of energy is kcal/day, then the requirement unit of energy should be kcal/day.

Step 2
Select a formula and click the Balance This Formula button. In the Balance window, enter the ingredients and nutrients that will be used with this formula. The ingredient restrictions of the Balance window can be transferred to the Requirement window in Step 4 below. Exit the Balance window.

Step 3
Right-click the Balance This Formula button and the Requirement window opens. Enter the animal's minimum daily requirements in the minimum column of the nutrient table. Click the Balance button to get a least-cost requirement feed. Click the Weight (#) button if you want to set the daily intake.

Step 4
The ingredient restrictions of the Balance window will be transferred to the Requirement window if the Ingredients box is checked.

Step 5
Check the Save box, and click the Balance button. Click the Save button, save the requirement feed as the current ration, and exit the Requirement window. Click the Edit This Formula button. Click the Print button and print Ingredients with prices and Nutrients with Daily amounts.

WARNING: Do not click a Change (!) button unless you want to transfer restrictions from the Balance window to the Requirement window. Clicking the right-most Change (!) button deletes the minimum daily requirements that you entered in Step 3.

The Change buttons

The Requirement window has two Change (!) buttons that convert a least-cost balanced ration into a least-cost requirement feed by transferring ingredient restrictions, nutrient restrictions, and nutrient ratios from the Balance window to the Requirement window. The Change (!) buttons can be used to compare balanced rations with requirement feeds (see the later section "Making the corresponding requirement feed".)

Before using the Change (!) buttons you should have a least-cost balanced ration in the Balance window that was created with the balanced ration method (see "The balanced ration method") and you must know the daily intake of the animal.

The right-most Change (!) button asks for the daily intake, and then changes the minimum and maximum nutrient restrictions of the Balance window into minimum and

maximum daily requirements based on the daily intake. This Change (!) button also copies ratios from the Balance window to the Requirement window.

If the left-most Change (!) button is clicked, the minimum and maximum ingredient restrictions of the Balance window are changed into minimum and maximum ingredient daily amounts in the Requirement window and a least-cost requirement feed is found. This Change (!) button uses the as fed intake in the AF Intake box and gives different results for different weights of the ration.

If you want to restrict the weight of the ration, click the Weight (#) button and enter a weight, or enter zero to let the weight vary between 0 and 1E+37. The weight is the animal's daily intake, which means dry matter intake if nutrients are restricted on a dry matter basis, and as fed intake if nutrients are restricted on an as fed basis. To restrict nutrients on an as fed or dry matter basis, click the Formulas button in the Mixit-Win menu, select the formula, and check or clear the Nutrients As Fed box.

The next two sections show how to compare a ration created with the balanced ration method with a ration created with the requirement feed method.

Comparing balanced rations with requirement feeds

This and the following section show how to compare the cost of feeding an animal by the balanced ration method with the cost of feeding by the requirement feed method. It is assumed that the minimum daily requirements of the animal are known and the following conditions are met by the least-cost balanced ration.

A. The minimum and maximum ingredient restrictions are on an as fed basis.
B. If nutrient restrictions are on an as fed basis, the daily as fed intake is known.

C. If nutrient restrictions are on a dry matter basis, the daily dry matter intake is known.
D. Each minimum nutrient restriction applied to the daily intake is the minimum daily requirement of the animal. (See the earlier section "The Daily button".)

The following steps will print a report that shows the cost of feeding by a least-cost balanced ration. The next section shows how to make the corresponding requirement feed.

1. Click the Balance This Formula button.

2. Adjust nutrient restrictions to D above with the Daily (!) button.
3. Save the balanced ration as the current ration.
4. Exit the Balance window.
5. Click the Edit This Formula button.
6. Enter the daily amount in the AF Intake box or DM Intake box.

7. Copy the number from the AF Intake box to the As fed box.
8. Click the Print button.
9. Print Ingredients with prices and Nutrients with Daily amounts.

10. Exit the Print and Edit windows.

Making the corresponding requirement feed

Using the least-cost balanced ration of the previous section, the following steps will move the ingredient, nutrient and ratio restrictions from the Balance window to the Requirement window, and print reports showing the cost of feeding by the requirement feed method.

The cost of the least-cost requirement feed will be less than or equal to the cost of the least-cost balanced ration. The least-cost requirement feed, however, meets the minimum daily requirements at a different daily intake.

1. Right-click the Balance This Formula button.
2. Click the right-most Change (!) button.
3. (Optional) Click the Weight (#) button
   and enter a daily intake or enter zero.
4. Click the left-most Change (!) button.
5. Check the Save box.
6. Save the requirement feed as the current ration.
7. Exit the Requirement window.
8. Click the Edit This Formula button.
9. Click the Print button and print Ingredients

   with prices and Nutrients with Daily amounts.
10. Exit the Print and Edit windows.

In Step 2, the Change (!) button asks for the daily as fed intake if the nutrient table of the Balance window restricts on an as fed basis, or the daily dry matter intake if the nutrient table of the Balance window restricts on a dry matter basis, and then replaces the minimum nutrient amounts of the Requirement window with the minimum daily requirements of the animal. Step 4 assumes that the minimum and maximum ingredient restrictions in the Balance window are on an as fed basis and inserts minimum and maximum ingredient amounts into the Requirement window.

When the Save box is checked in Step 5 and the requirement feed is saved as the current ration, the total ingredient amount in the Requirement window becomes the AF Intake in the Edit window. This shows the daily feed cost when the requirement feed is saved as the current ration and the Edit This Formula button is clicked.

Factoring the constraints

Ingredient, nutrient and ratio constraints have minimums of 0 or larger and maximums of 1E+37 or smaller. MIXIT-WIN lets you select a set of ingredient, nutrient or ratio constraints and 'factor' this set of constraints by multiplying all minimums or maximums in the set by the same number or 'factor'. For example, multiplying a set of minimum amounts by the factor 1.1 will increase all of the minimum amounts in this set by 10%.

Click the Print button (the button with a computer printer) and a window opens. Click the Factor 1 tab to factor ingredient constraints, the Factor 2 tab to factor nutrient constraints, and the Factor 3 tab to factor ratio constraints. Each factor tab shows a list of names, a minimum box, a maximum box and three buttons: OK, Undo and Exit. Select the names in the list that you want to factor. Then enter a number to 'Multiply Minimum by', enter a number to "Multiply Maximum by', and click the OK button. Click the Undo button to cancel this action.

You select multiple items in a list box by holding down the SHIFT key and clicking them with the mouse or by holding down the SHIFT key and pressing an arrow key to extend the selection from the previously selected item to the current item. You can also select items by dragging with the mouse. Holding down the CTRL key and clicking an item selects or deselects that item.

Multiplying a minimum amount by a factor has no effect if the minimum amount is 0. Similarly, multiplying a maximum amount by a factor has no effect if the maximum amount is 1E+37. If your selection does not include an item whose minimum is greater than 0 or whose maximum is less than 1E+37, the OK button is disabled (grayed out.)

Excel formulas

You balance a ration in MIXIT-WIN by first selecting a formula and then clicking the Balance This Formula button. If you want this formula to have at least 1530 kcal/lb of energy, you enter 1530 as the minimum amount of energy. Suppose, however, that the minimum amount of energy comes from an equation like

Energy = [(W^0.75)(173 - 1.95T) + 5.5 DW + 2.07 EE] / N

where W = 1.5, T = 22, DW = 0, EE = 60, and N = 0.2. In this case, you would use a hand calculator to calculate 1502.689655 and enter this number as the minimum amount of energy.

Calculating nutrient amounts from equations, like the one above, is tedious and subject to error. A better way is to write your equation as an "Excel formula" in a Microsoft Excel spreadsheet and let Excel and MIXIT-WIN do all of the work for you. The following topics

describe Excel spreadsheets and Excel formulas, and how MIXIT-WIN interacts with Excel spreadsheets and Excel formulas.

If you only use an equation one or two times, it may not be worth the effort to write it as an Excel formula. But if you use it frequently, the time you spend putting it into Excel will be quickly recovered in the speed and accuracy of the results.

Who should use Excel formulas?
Although they are easy to use, not everyone will need Excel formulas when they balance rations. Those whose research involves ration formulation based on animal requirements derived from equations should certainly consider using Excel formulas. Consulting nutritionists can use Excel formulas if their nutrient requirements often require them to resort to sessions with a hand calculator. Excel formulas can also be used as a way to save different nutrient constraints for the same ration even if the nutrient constraints do not come from equations.

What is going on here?
Behind the scenes is a process, called Automation, by which Microsoft Access sends data to Microsoft Excel, and Microsoft Excel, in turn, sends data back to Microsoft Access. You do not need to know the details of this process, except to note that errors may result if you do not follow the instructions in the following sections for using Excel formulas to change MIXIT-WIN formulas.

What are Excel formulas?

You can enter minimum and maximum amounts of nutrients from equations that you define in a Microsoft Excel spreadsheet. The equations that you define in an Excel spreadsheet are called “Excel formulas”.

Excel formulas give you a way to enter minimum and maximum nutrient amounts from equations at the same time as you balance a ration (after clicking the Balance This Formula button in the main menu of MIXIT-WIN.) Excel formulas may be complicated, as the example in the earlier topic shows, or they may be simple. In either case, once you have defined one or more Excel formulas in an Excel spreadsheet it is an easy matter to use them while you are balancing a ration in MIXIT-WIN.

Excel formulas and Excel workbooks
In Microsoft Excel, a “formula” is an equation that analyzes data on a worksheet. In MIXIT-WIN, a “formula” is a container that holds both a current ration and a balanced ration. To avoid misunderstanding, a formula in Excel will be called an “Excel formula”.

In Microsoft Excel, a “workbook” is a file in which you work and store your data. A workbook contains “worksheets”, which are documents that consist of cells organized into columns and rows. A worksheet is sometimes called a “spreadsheet”. The following

sections refer to an Excel workbook named “Equations.xls”. The file Equations.xls is a copy of Equation10.xls, which has ten worksheets.

The workbook Equation10.xls
The Excel workbook “Equation10.xls” was copied to the folder C:\Program Files\MixitWn6 during the installation of MIXIT-WIN. This workbook has ten worksheets with the names Sheet1, Sheet2, …, Sheet10. An easy way to create another Excel workbook with ten worksheets is to copy and rename “Equation10.xls” (in Windows Explorer or My Computer.) You should use a copy of “Equation10.xls,” and not the file “Equation10.xls” itself, to avoid losing your work if you update MIXIT-WIN.

How MIXIT-WIN communicates with Excel

After selecting a formula in the main menu of MIXIT-WIN and clicking the Balance This Formula button, the Balance window appears. The button between the nutrient drop-down box and the Undo button is the Excel button (the button with the green X logo.) Click the Excel button and the Equations window appears.

The Equations window has a datasheet that shows four columns of the nutrient datasheet in the Balance window, an Exit button that returns you to the Balance window, and three other buttons, Excel, Export and Import, that make up the interface between MIXIT-WIN and Excel.

Selecting a workbook and a worksheet
The Equations window has a “Path” box in which you enter the path and name of an Excel workbook, for example C:\Program Files\MixitWn6\Equations.xls. Equations.xls should be a copy of Equation10.xls (see the earlier topic “What are Excel formulas?”) This Excel workbook has ten worksheets, and you select one of them in the “Spreadsheet” drop-down box.

Select Sheet5 in the “Spreadsheet” box, click the Excel button (the button with the green X logo,) and an Excel worksheet appears. This is Sheet5 (you see this name at the bottom of the worksheet) of workbook “Equations.xls” (you see this name at the top of the worksheet) whose path and name you entered in the “Path” box of the Equations window.

Sheet4 could refer to a swine ration and Sheet5 to a layer ration. Or, Sheet4 and Sheet5 could hold different nutrient constraints for the same layer ration. Look in row 1 of column F of the worksheet to see the name of the MIXIT-WIN formula.

Restore Down
Click the “Restore Down” button in Excel to see the Equations window and the Excel worksheet at the same time. The “Restore Down” button is at the upper-right corner of the Excel window between the Minimize (-) button and the Exit (X) button.

Warning
If you change the nutrient datasheet in the Balance window by adding or deleting nutrients, you must click the Export button in the Equations window to update your worksheet before you click the Import button. Failure to do this may cause wrong numbers to be entered into the Balance window, since the nutrients in the worksheet are now different from the nutrients in the Balance window.

Exporting and importing nutrient amounts

Use the Export button to export the nutrient minimum and maximum amounts of the formula in the Balance window to any of the ten worksheets. When you do this, you will be warned if there is a formula name in the worksheet that is different from the formula name in the Balance window, and you can cancel the operation.

When you export to a worksheet, the worksheet is populated with current nutrient names and numbers from the MIXIT-WIN formula in the Balance window. The names appear in column A of the worksheet, the minimum and maximum numbers appear in columns B and D, respectively, and the formula name appears in row 1 of column F. You should never change items in columns A, B and D, or the formula name in row 1 of column F, by hand.

Exporting to different workbooks or worksheets
You can export nutrient minimum and maximum amounts of the same formula to all ten worksheets of the workbook “Equations.xls,” or you can export nutrient minimum and maximum amounts of different formulas to different worksheets of “Equations.xls.” You can also use many different workbooks, which, for convenience, can be copies of “Equation10.xls.” There is nothing special about the workbook “Equation10.xls” except that it is an Excel 2000 workbook with ten worksheets named Sheet1, Sheet2, …, Sheet10.

Columns of the worksheet
Columns C and E of the worksheet hold Excel formulas. Originally, MIXIT-WIN puts special Excel formulas into columns C and E that cause columns B and C to be identical, and columns D and E to be identical. (How this is done is explained in the topic “What the Export button does”.) You then have an opportunity to change any of the Excel formulas in columns C and E.

Importing from a worksheet
Use the Import button to import the nutrient minimum and maximum amounts from any of the ten worksheets to the Balance window. You won’t be allowed to proceed if the formula name (in row 1 and column F) of the worksheet is different from the formula name in the Balance window because, in this case, the worksheet has data from a different MIXIT-WIN formula.

When you export data with the Export button, the current nutrient amounts are put into columns B and D; when you import data with the Import button, the new nutrient amounts come from columns C and E, which are columns that hold Excel formulas. In this way, every minimum and maximum nutrient amount that you import into the Balance window comes from an Excel formula.

A brief tour of Excel formulas

Microsoft Excel labels columns with letters (A - IV) and rows with numbers (1 - 65536). To refer to a cell, enter the column letter followed by the row number. For example, C6 refers to the cell at the intersection of column C and row 6. To refer to a range of cells, enter the reference for the cell in the upper-left corner of the range, a colon (:), and the reference for the cell in the lower-right corner of the range. The following are examples of references.

To refer to the cell in column A and row 10, use A10
To refer to the range of cells in column A and rows 10 through 20, use A10:A20
To refer to the range of cells in row 15 and columns B through E, use B15:E15

Types of Excel formulas

There are many types of Excel formulas and many ways to change and display Excel formulas, and you should consult the Help topics of Excel for more information. For the purpose of using equations to modify nutrient minimums and maximums, an Excel formula is a mathematical expression, preceded by an equal sign (=), that obeys the usual rules for addition (+), subtraction (-), multiplication (*), division (/) and exponentiation (^). Here are examples of Excel formulas.

= 2 * 3 + 5 means multiply 2 and 3, then add 5

= 3 * E1 - 2.5 * E2 means 3 times the number in cell E1
minus 2.5 times the number in cell E2

= 1 + Cost means 1 plus the number in the cell
whose name is Cost

In the last example, ‘Cost’ is the name of a cell. You will find it useful to name some of the cells in your worksheets, as shown next.

How to name a cell

To name (or rename) a cell, click the cell that you want to name. Click the “Name” box at the left end of the formula bar. (The formula bar is directly above the row of letters A, B, C, D, …) Type the name for the cell, and press the Enter key. You can delete the name of a cell as follows: On the “Formulas” tab, in the “Define Names” group, click “Name Manager”; then click a cell name and click “Delete”.

Entering an Excel formula
You enter an Excel formula into a worksheet by typing the Excel formula (including the equal sign) into a cell of the worksheet. For example, type the following expression into cell C2

= B2 + 3 * F5

If you do this, the number in C2 becomes the number in B2 plus 3 times the number in F5.

Seeing an Excel formula
Click any cell. If the number in the cell comes from an Excel formula, you will see this Excel formula in the formula bar. (The formula bar is directly above the row of letters A, B, C, D, …)

Example
An earlier topic introduced the following nutrient energy equation.

Energy = [(W^0.75)(173 - 1.95T) + 5.5 DW + 2.07 EE)] / N

where W, T, DW, EE and N are parameters that represent weight, temperature, weight change, egg mass, and intake. In order to enter values for these five parameters, and make them easy to change, you can select five cells on a worksheet and change the names of these cells to W, T, DW, EE and N. The energy equation can then be written as the following Excel formula.

= (W^0.75 * (173 - 1.95*T) + 5.5 * DW + 2.07 * EE) / N

This Excel formula appears later in the topic “Putting it all together.”

What the Export button does

It is now easy to explain the Excel formulas that appear in columns C (Min Formula) and E (Max Formula) when you click the Export button. Assume, for the moment, that the cells in columns C and E of the selected worksheet are empty, which would be the case if this is a new worksheet or you previously cleared these columns. (You clear a column of a worksheet by first clicking the letter at the top of the column - this highlights the column - and then pressing the Delete key on the keyboard. After you clear a column, each cell in the column is empty.)

Clicking the Export button
When you click the Export button, the worksheet is populated with current nutrient names and numbers from the Balance window. The names appear in column A of the worksheet, the minimum and maximum numbers appear in columns B and D, respectively, and the formula name appears in row 1 of column F. In addition, Excel

formulas are put into columns C and E in order to make the numbers in columns B and C identical, and the numbers in columns D and E identical. These Excel formulas are shown below.

	Column C	Column E
Row 1	Min Formula	Max Formula
Row 2	=B2	=D2
Row 3	=B3	=D3
Row 4	=B4	=D4
Etc.		

These Excel formulas appear if all of the cells in columns C and E are empty. If, on the other hand, some cells of columns C and E are empty and some are not, then the Excel formulas shown above are put into the empty cells, and the non-empty cells are not changed.

IMPORTANT: Clicking the Export button does not change any cell in columns C and D unless it is empty (or it is the header cell in row 1.)

Clicking the Import button

When you click the Import button of the Equations window, all of the minimum and maximum nutrient numbers come from columns C and E. If you do not change the Excel formulas that were originally put into columns C and E, then you will import the same numbers that you previously exported, and the ration will not change. The whole point of using Excel formulas with MIXIT-WIN is to change one or more of the Excel formulas that the Export button put into columns C and E, and this is explained in the next topic.

Putting it all together

As an example of a non-trivial calculation, the following equation can be used to determine the minimum daily energy requirement of chickens. (See the National Research Council publication, “Nutrient Requirements of Poultry,” ninth revised edition, 1994, page 24.)

ME (kcal/day) = (W^0.75)(173 - 1.95T) + 5.5 DW + 2.07 EE

where ME = metabolizable energy per hen per day (kcal), W = body weight (kg), T = ambient temperature (C), DW = change in body weight (g/day), and EE = daily egg mass (g). Assuming a feed intake of N pounds per chicken per day, the following equation can determine the minimum energy concentration of a poultry ration.

ME (kcal/lb) = [(W^0.75)(173 - 1.95T) + 5.5 DW + 2.07 EE)] / N

Instead of entering values for the parameters W, T, DW, EE, N and performing this calculation by hand, you can enter this equation into an Excel spreadsheet, change the value of one or more of the parameters, and let Excel do the work for you.

This example shows how to enter one equation that changes the minimum amount of a single nutrient, “metabolizable energy”, when you click the Import button of the Equations window. The same method can be used to enter many equations that change the minimum or maximum amounts of many nutrients when you click the Import button of the Equations window. You could, if you wish, change all of the minimum and maximum nutrient amounts with a single click of the Import button.

Exporting nutrient constraints

In the main menu of MIXIT-WIN, select “Layer Ration,” or a similar formula, and click the Balance This Formula button. Click the Excel button (the button with the green X logo) to open the Equations window. Enter the path “C:\Program Files\MixitWn6\Equations.xls”, select Sheet5, and click the Export button. Assuming that Sheet5 is a new worksheet, or you previously cleared columns C and E, a worksheet appears with identical numbers in columns B and C, and identical numbers in columns D and E. (See the topic “What the Export button does” for an explanation of columns C and E.)

Defining Excel formulas

In defining Excel formulas, stay away from columns A, B and D, and cell F1, since this is the area of the worksheet that MIXIT-WIN controls. Although you are free to put Excel formulas anywhere you like outside this area, a good way to organize your worksheet is to put all Excel formulas for a nutrient in the same row as the nutrient name, starting in column F or later.

The earlier topic “A brief tour of Excel formulas” showed how the energy equation ME = [(W^0.75)(173 - 1.95T) + 5.5 DW + 2.07 EE)] / N can be written as the Excel formula

= (W^0.75 * (173 - 1.95*T) + 5.5 * DW + 2.07 * EE) / N

where W, T, DW, EE and N are the names of cells on a worksheet. To enter this formula in your worksheet, name six cells of the worksheet in the following way. (Don’t forget to press the Enter key after you type a name in the ‘Name’ box.)

Cell	F2	G2	H2	I2	J2	K2
Name	ME	W	T	DW	EE	N

In cell ME enter the Excel formula

= (W^0.75 * (173 - 1.95*T) + 5.5 * DW + 2.07 * EE) / N

and in cell C2 enter the Excel formula

=ME.

After entering data in a cell, move to another cell or press the Enter key; otherwise, the data is not saved, and error messages may force you to restart MIXIT-WIN.

You can also enter the Excel formula for minimum energy directly into cell C2, since MIXIT-WIN does not change cells in columns C and E unless they are empty. (See the earlier topic “What the Export button does.”) Putting the Excel formula for energy into its own cell is a little safer, however, since it allows you to clear columns C and E without destroying your equations.

Error messages (#DIV/0!) appear in the cells C2 and F2 to warn you that you are dividing by zero. This is because the Excel formula in ME involves division by N, the cell N is empty, and Excel thinks an empty cell has the value zero. Enter the values for the parameters W, T, DW, EE and N by entering the following numbers in the cells.

Cell	G2	H2	I2	J2	K2
Name	W	T	DW	EE	N
Number	1.5	22	0	60	0.2

Click the “Restore Down” button in Excel to see the Equations window and the Excel worksheet at the same time. The “Restore Down” button is at the upper-right corner of the Excel window between the Minimize (-) button and the Exit (X) button.

Click the Import button to change the minimum amount of energy, and click the Exit button to return to the Balance window. The minimum nutrient amount has now been changed by the poultry equation.

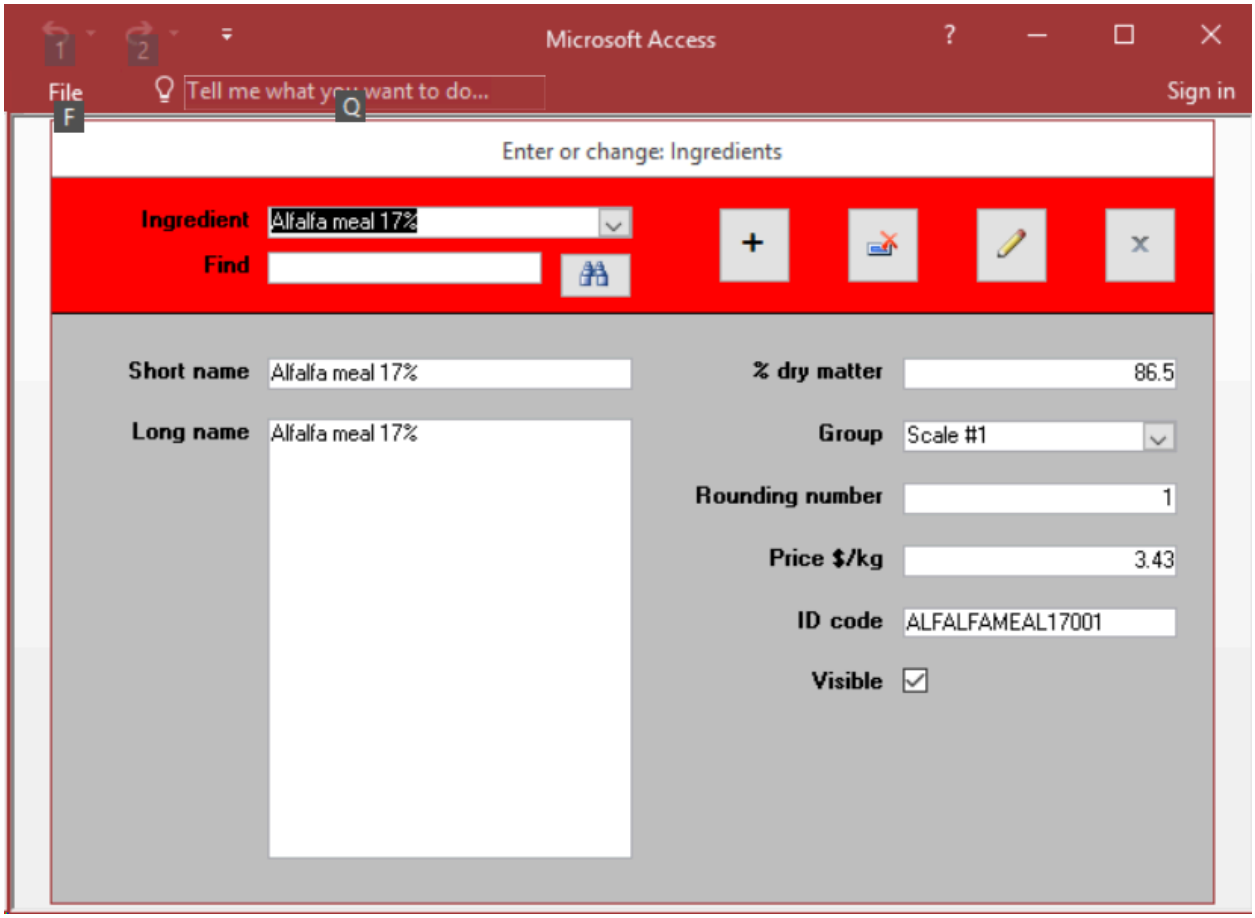
Ingredients

Ingredients and nutrients are the building blocks of rations. Each ingredient in MIXIT-WIN contains an amount of each nutrient in MIXIT-WIN. Ingredients - also called feeds or feedstuffs - are edible materials that are consumed by animals and contribute energy or nutrients to the animal’s diet. The chief classes of ingredients are forages, roughages, pasture, range plants, silages, energy feeds, protein supplements, mineral supplements, vitamin supplements, and additives. Nutrients are feed constituents in a form and at a level that will help support the life of an animal. The chief classes of feed nutrients are proteins, fats, carbohydrates, minerals, vitamins, and energy.

Names and amounts
MIXIT-WIN has a database of ingredients and nutrients that is changed with four buttons on the right side of the Main Menu: Ingredients (enter or change ingredient names),

Nutrients (enter or change nutrient names), By Ingredient and By Nutrient (enter or change amounts of nutrients in ingredients.)

The Ingredients window



To create a new ingredient or change an existing ingredient, click the Ingredients button in the main menu. This window has an ingredient drop-down box, a find box, four buttons including an Exit button, and boxes in which you enter or change the ingredient Short and Long names, Group type, % dry matter, ID code, Rounding number, Price and Visibility.

Selecting ingredients

To select an ingredient, click the small down arrow at the right side of the ingredient drop-down box and click the ingredient name. Use the scroll bar or find box for help in finding an ingredient.

To add a new ingredient, click the Add button, which is the button with the plus sign (+). After adding a new ingredient, be sure to enter the % dry matter. The % dry matter is necessary for calculating as fed amounts of nutrients and formulas.

To delete an ingredient, first select the ingredient from the ingredient drop-down box, and then click the Delete button, which is the button with the symbol X. The Delete button permanently removes an ingredient from the database. Instead, you can make the ingredient invisible, as explained next.

Visibility
Check the Visible box if you want this ingredient to appear in other windows and in printed reports. If you clear (un-check) the Visible box, this ingredient will only appear in this window (the Ingredients window) and in the two windows opened with the By Ingredient and By Nutrient buttons of the main menu. You should clear (un-check) the Visible box of an ingredient that you are not using, but may use or look at in the future; and you should only delete an ingredient that you will never use or want to look at again

Ingredient Names

There are two ingredient names, a short name and a long name. The short name of an ingredient has 1 to 32 characters, which can be letters, numbers or other symbols including spaces. Ingredient names are shown in alphabetical order in drop-down boxes (except for one drop-down box of the Balance window.) When entering ingredient names you should choose distinctive names. For example, instead of using a general name such as “Corn”, it is better to use a specific name such as “Corn gluten meal, 60% protein”.

Long names
The long name of an ingredient can be up to 65,535 characters. You can use the long name for a comment about the ingredient. The main use for long ingredient names is the ingredient statement of a feed label (see “The ingredient statement” in Feed Labels Help.)

Printing ingredient names and ID codes
To print ingredient short names and ID codes, from the main menu click the By Nutrient button, the Print/Save button (the button with the lock), and the Print button (the button with the printer.)

ID Codes

An ingredient ID code is a 16-character name consisting of letters A-Z and numbers 0-9 which identifies the ingredient. Different ingredients should have different ID codes. Ingredient ID codes are printed by clicking the By Nutrient button, the Print/Save button (the button with the lock) and the Print button (the button with the printer.)

Ingredient ID codes are used to transfer formulas between databases (see “Options: Sending and receiving formulas” in Options Help), to communicate with a feed mill control system (see “Working with a feed mill” in Inventory Help) and to arrange

ingredients on reports (see “Edit This Formula: Arranging the ingredients” in Formulas Help.)

Rounding numbers
A rounding number is a number between 0 and 100 that is used to round ingredient amounts on printed reports. For example, the rounding number 0.01 rounds an ingredient amount to the nearest 1/100 LB or KG; the number 5 rounds to the nearest 5 LB or KG (see “Printing the current ration” in Formulas Help.)

Ingredient Prices

The Price box contains the current price of an ingredient. The current price of an ingredient is the price that is used in calculating balanced, least-cost rations and printing reports that show prices. The unit of price ($/kg, $/cwt, $/lb or $/ton) is also shown.

Unit of price
To change the unit of price for all ingredients, from the main menu click the Options button and change the name in the price name box. The units of weight and units of price are related and should be changed together. (See “Metric units and American units” in Options Help.)

Current prices
There are several ways to change the current price of an ingredient. The best way to change prices from the main menu is to click the Options button and then click the Change prices button (the button with the pencil.) You can also change current prices in the Balance window (see “Balancing a ration” in Balance This Formula Help.)

Since the current prices are so easily changed, you should regard current prices as temporary and store the true prices of ingredients in one of the six alternate prices.

Alternate prices
In addition to the current price, each ingredient has six alternate prices: Price 1, Price 2, Price 3, Price 4, Price 5 and Price 6. These prices can have any meaning you wish to assign to them. For example, Price1 could be the current prices you pay for ingredients, which you use to get least cost rations, Price2 and Price3 are wholesale and retail prices, and Price 4, Price 5 and Price 6 are ingredient prices from different suppliers. These prices are never used until you select them from the main menu by clicking the Options button and choosing an option such as ‘Use price 3’ (see Options Help.)

Dry matter % of an ingredient

The dry matter percentage of an ingredient is a number between 0 and 100 that is used to find the as fed content of rations and to convert as fed ingredient amounts to dry matter amounts. Dry matter percentages are found in standard feed tables (see “Nutrient Amounts of Ingredients” in Nutrients Help.)

Moisture

The % moisture of an ingredient or a ration is 100 minus the % dry matter of the ingredient or ration. Rations can be printed with a pre-selected moisture content (see “Edit This Formula: Printing the current ration” in Formulas Help.) You can also control the moisture content of rations (see “Restricting moisture in a ration” in Nutrients Help.)

Ingredient groups on batch weight reports

Each ingredient belongs to a group such as “Bulk”, “Hand Add” or “Liquids”. All ingredients in the same group can be printed together in a batch weight report of type ‘Batch 1’ (see “Edit This Formula: Printing the current ration” in Formulas Help.). Click the arrow at the right side of the group drop-down box and select the group in which this ingredient will appear on Batch 1 reports. (To see a Batch 1 report, from the main menu click the Edit This Formula button, click the Print button, click Batch 1, and check the Group box.) The next paragraph shows how to change the names that appear in the group drop-down box of this window (the Ingredients window), and the names of six boxes that also appear on Batch 1 reports.

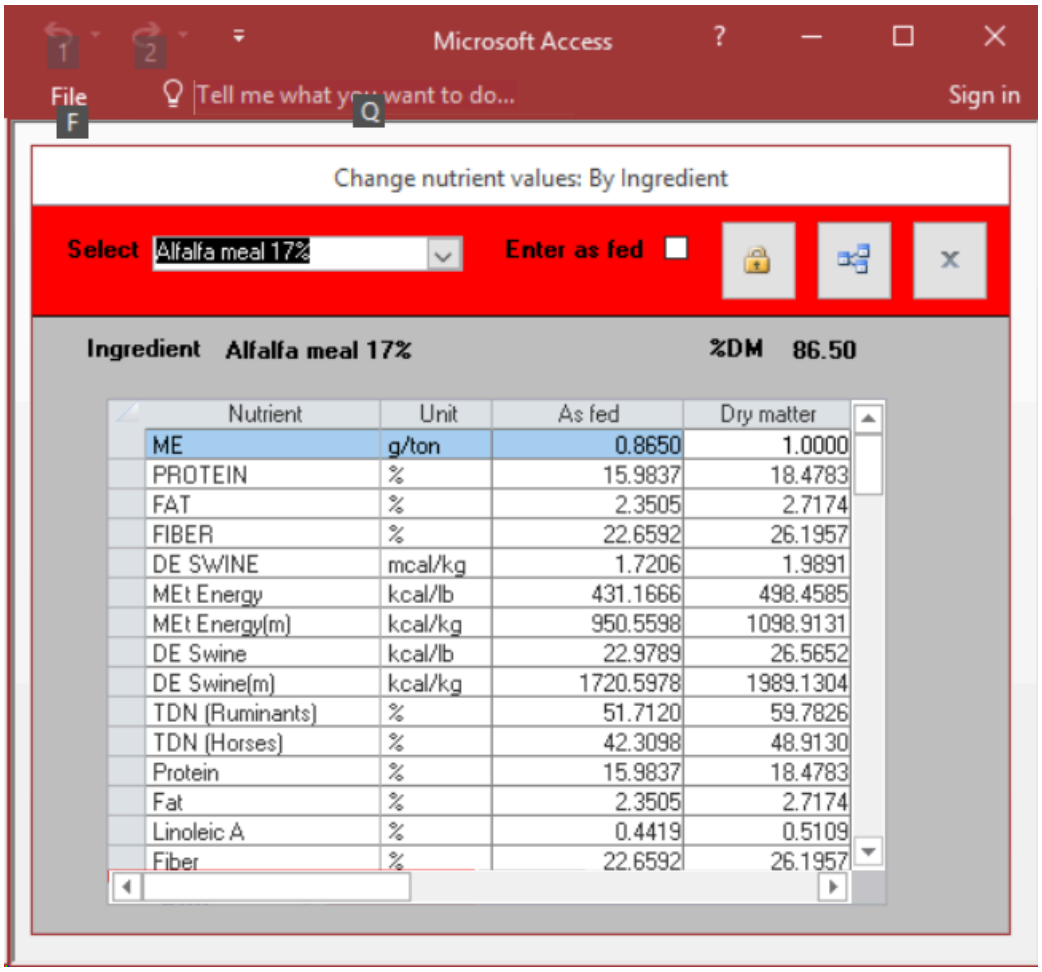
Changing group names and report names

Click the Change button (the button with the pencil) and a window pops up with seventeen items that you can change. The first eleven names (items 0, 1, …, 10) are the group names such as “Bulk”, “Hand Add’ and “Liquid”. These eleven group names are followed by six additional names (items 11, 12, …, 16) such as “For”, “Lot”, “Product”, “Bin”, “Batches” and “Needed” that are the titles of boxes that will appear on every Batch 1 report. Enter a blank name if you do not want a name to appear on Batch 1 reports. Group names and additional names cannot exceed 50 characters.

Changing price names

Six more names (items 21, 22, …, 26) are the names of the six alternate prices: Price 1, Price 2, …, Price 6. (See Options Help.) Price names cannot exceed 50 characters.

By Ingredient



Changing values by ingredient

To change the nutrient amounts of ingredients in the master ingredient list, click the By Ingredient button in the main menu.

The Enter as fed box

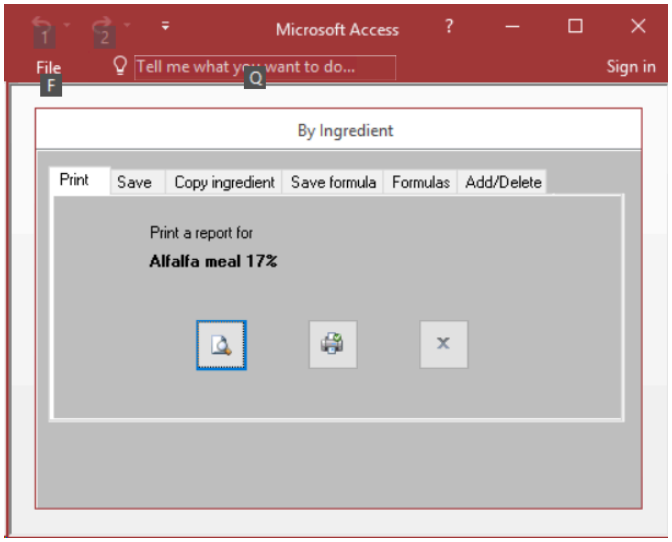
This window has a drop-down box, a table, a check box, and three buttons. Choose an ingredient from the drop-down box, and enter the nutrient amounts for this ingredient in the ‘Dry matter’ column of the table. You can enter these values on an as fed basis if you check the ‘Enter as fed’ box. The values that you enter are automatically saved.

The dry matter column

Always enter nutrient amounts in the ‘Dry matter’ column of the table, even if you check the As Fed box. MIXIT-WIN calculates the correct amounts to be entered into the As Fed and Dry Matter columns based on the dry matter percentage of the ingredient (see the earlier topic “Dry matter % of an ingredient.”)

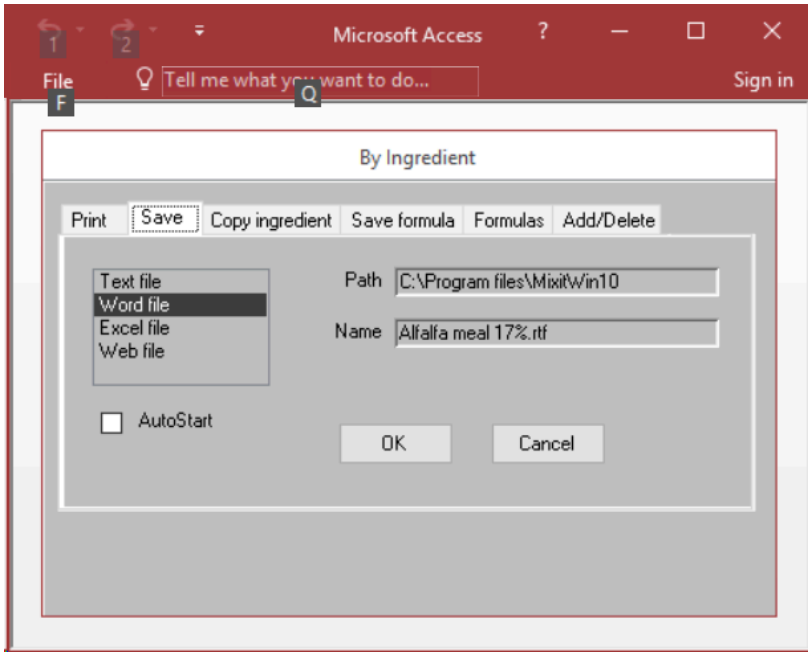
The Print/Save button (the button with the padlock) is explained in the following topic. The Equations button (the button with three small boxes) is used to activate nutrient equations. Nutrient equations are explained in Nutrients Help.

The Print/Save button



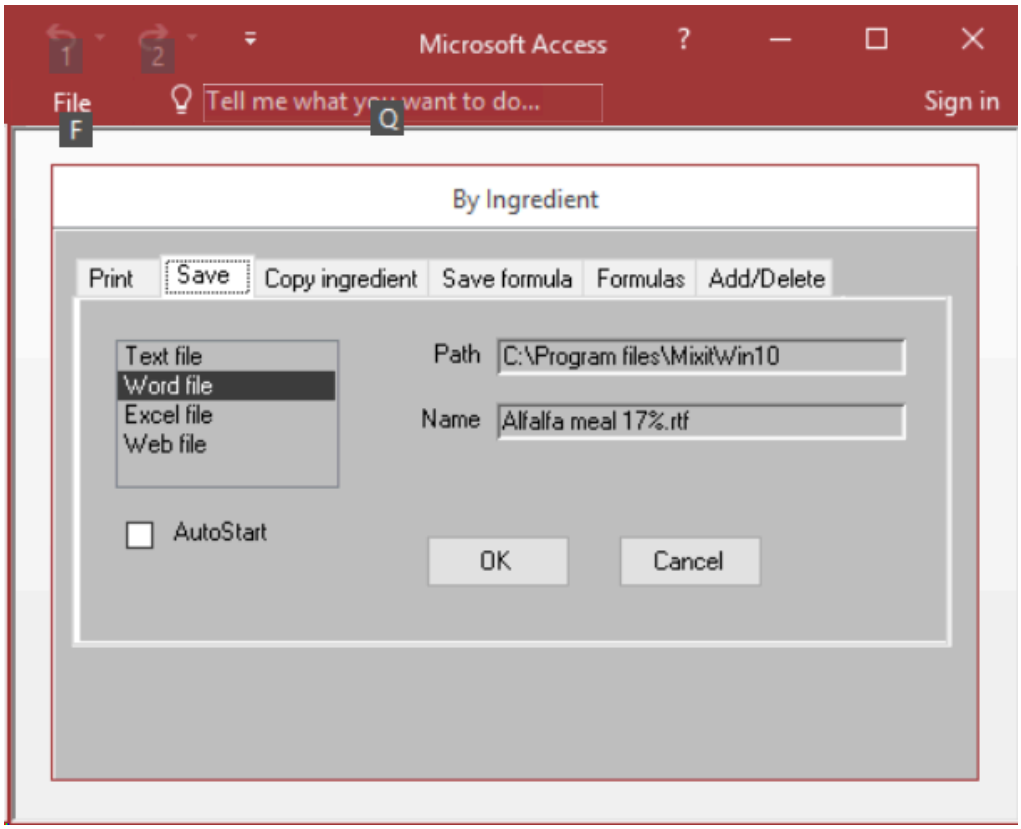
Click the Print/Save button (the button with the padlock) and a window with six tabs appears. These tabs will print and an ingredient showing all nutrients, copy an ingredient, save a formula as an ingredient, find formulas with the selected ingredient, and add or delete the selected ingredient in many formulas.

Printing nutrient names and ID codes



Select the 'Print' tab to see or print the ingredient that was selected in the previous window. Click the Preview button or the Print button to see or print the selected ingredient with all nutrient names and amounts. This is the way to print all nutrient names and nutrient ID codes in the current database.

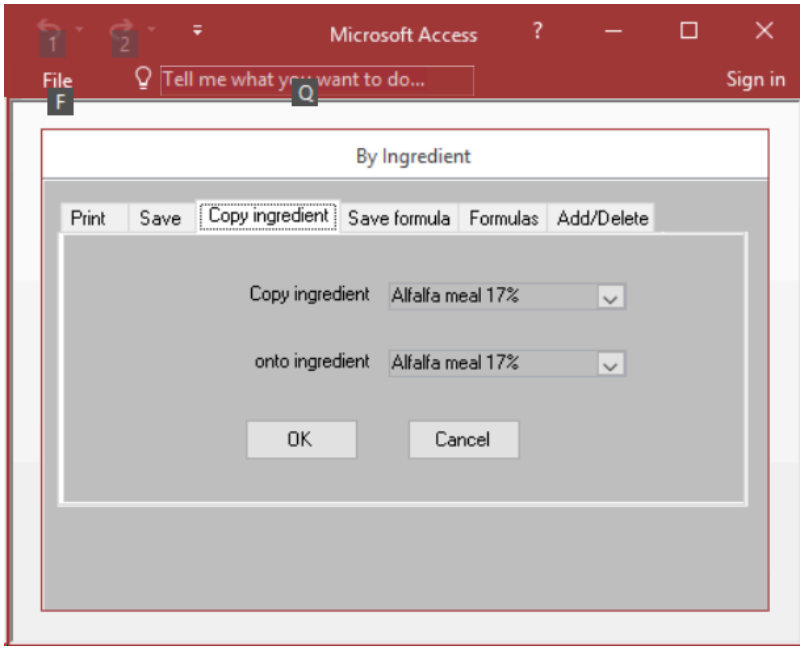
Saving nutrient names to a disk file



Select the Save tab to save the nutrient names of the selected ingredient to a disk file. In the list box, click Text file to save the names as a file that can be seen in Microsoft NotePad, or click Rich Text Format file to save the names as a file that can be opened in Microsoft Word. In the Path box, enter the location of the saved file.

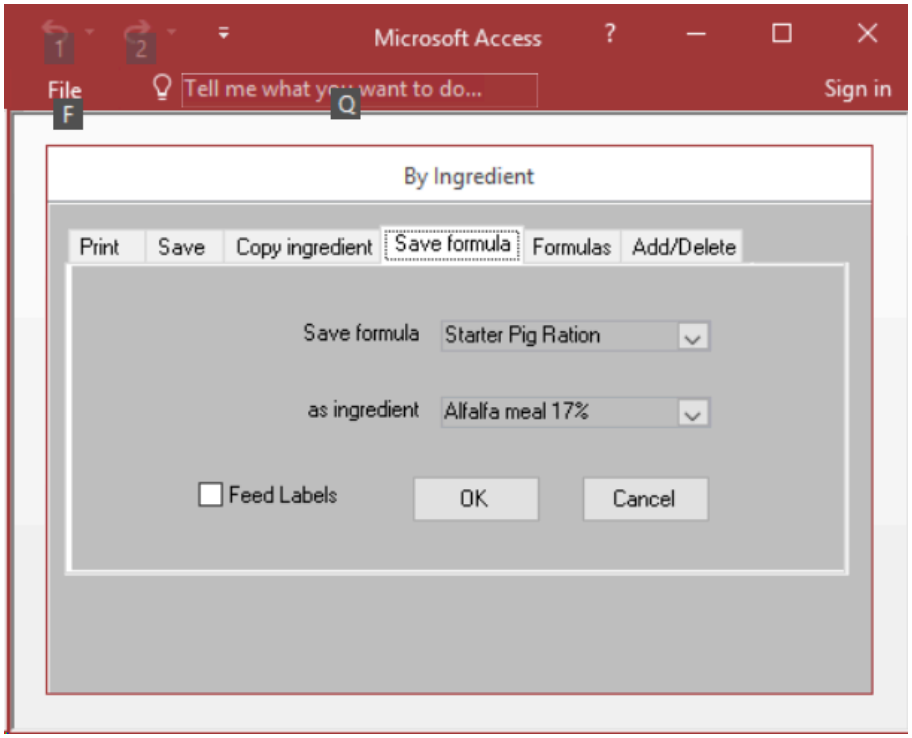
For example
Enter A: to save to a disk in drive A, or C:\Program Files\MixitWn6 to save to the folder MixitWn6 which is under the folder Program Files on drive C. In the Name box, enter the name of the file that will be saved. Click the OK button to save the file. If the AutoStart box is checked, clicking the OK button saves the file and automatically opens it in NotePad if Text file was selected, and in Word if Rich Text Format file was selected.

Copying one ingredient onto another ingredient



Select the 'Copy ingredient' tab to copy one ingredient onto another ingredient, replacing all values of the second ingredient. Select the ingredient to be copied from the Copy ingredient drop-down box, and select the ingredient to be replaced from the onto ingredient drop-down box. To copy an ingredient onto a new ingredient, you must first create the new ingredient. You create a new ingredient from the main menu by clicking the Ingredients button, and the Add button (the button with the plus (+) sign.)

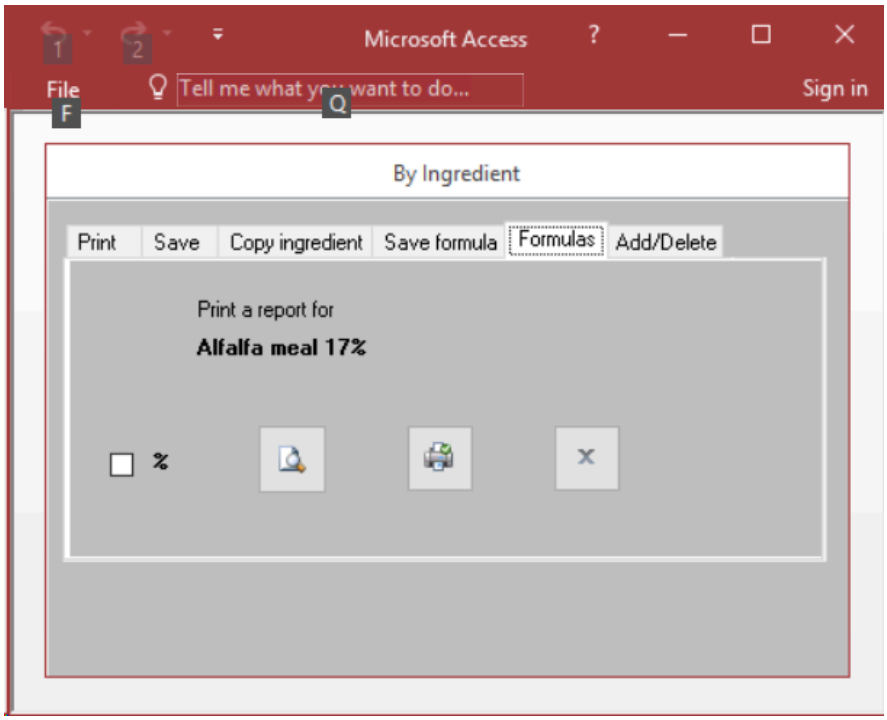
Saving a formula as an ingredient



Select the ‘Save formula’ tab to save the nutrient values of the current ration of a formula as an ingredient. Select the formula from the ‘Save formula’ drop-down box, and the ingredient from the ‘as ingredient’ drop-down box. To save a formula as a new ingredient, you must first create the new ingredient. You create a new ingredient from the main menu by clicking the Ingredients button and the Add button (the button with the plus (+) sign.)

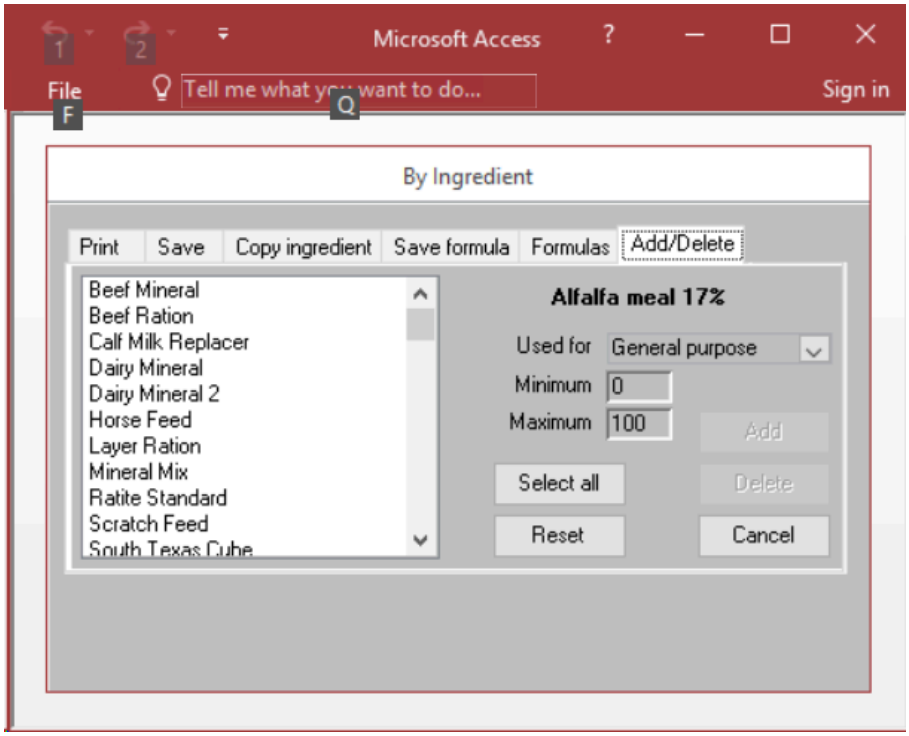
When you save a formula as an ingredient, the nutrient values, the % dry matter, the price, and the ingredient long name change. If you check the ‘Feed Label’ box, the new ingredient long name is a list of all of the long names of ingredients in the current ration whose ingredient amounts are greater than zero. This long name is used in the ingredient statement of a feed label (see “The ingredient statement” in Feed Labels Help.)

Finding formulas that have a selected ingredient



Select the ‘Formulas’ tab to find all formulas that contain the ingredient that was selected in the previous window. Use the Preview or Print buttons to see or print the formulas. Check the % box to see the as fed percentages of the selected ingredient in the current rations. Clear the check box to see the minimum and maximum constraints of the selected ingredient in the balanced rations. This tab gives useful information when you are in the ‘Add/Select’ folder, which is the next topic.

Adding or deleting ingredients in many formulas



Select the ‘Add/Delete’ tab to add the ingredient, which was selected in the previous window, to many formulas, or delete it from many formulas.

When you add an ingredient to a formula, the ingredient will be available the next time you calculate a balanced ration for this formula. When you delete an ingredient from a formula, it is deleted from the current ration and the balanced ration. That is, adding an ingredient only affects the next balanced ration, but deleting an ingredient changes the last current ration and the next balanced ration.

How to select formulas

There are three ways to select the formulas that the ingredient will be added to or deleted from. You select (or deselect) formulas by clicking their names in the list box. You can select all formulas by clicking the Select all button, or deselect all formulas by clicking the Reset button. And you can select formulas of a particular formula type by selecting the formula type in the Used for drop-down box.

Minimum and maximum percentages

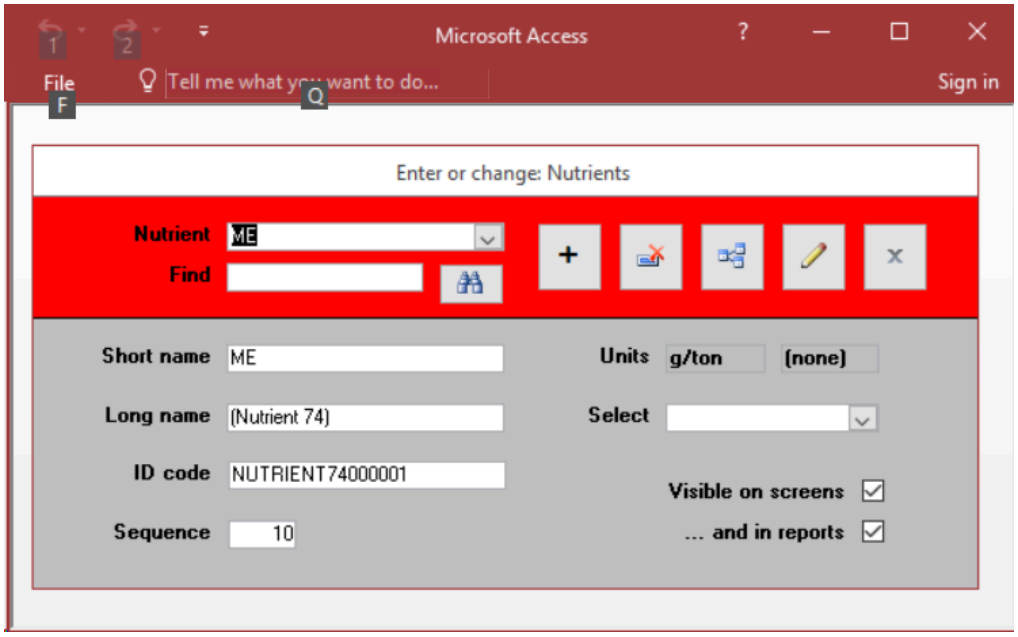
After selecting the formulas, change the minimum and maximum percentages of this ingredient, and then click the Add button. The minimum and maximum percentages are used for all of the selected formulas. The ‘Formulas’ tab, described in the preceding topic, gives useful information about the formulas that contain this ingredient.

Nutrients

Ingredients and nutrients are the building blocks of rations. Each ingredient in MIXIT-WIN contains an amount of each nutrient in MIXIT-WIN. Ingredients - also called feeds or feedstuffs - are edible materials that are consumed by animals and contribute energy or nutrients to the animal's diet. The chief classes of ingredients are forages, roughages, pasture, range plants, silages, energy feeds, protein supplements, mineral supplements, vitamin supplements, and additives. Nutrients are feed constituents in a form and at a level that will help support the life of an animal. The chief classes of feed nutrients are proteins, fats, carbohydrates, minerals, vitamins, and energy.

Names and amounts
MIXIT-WIN has a database of ingredients and nutrients that is changed with four buttons on the right side of the main menu: Ingredients (enter or change ingredient names), Nutrients (enter or change nutrient names), By Ingredient and By Nutrient (enter or change amounts of nutrients in ingredients.)

The Nutrients window



To create a new nutrient or change an existing nutrient, click the Nutrients button in the main menu. This window has a nutrient drop-down box, a find box, five buttons including an Exit button, and boxes in which you enter or change the nutrient Short and Long names, ID code, Sequence number, Units and Visibility.

Selecting nutrients

To select a nutrient, click the small down arrow at the right side of the nutrient drop-down box and click the nutrient name. To add a new nutrient, click the Add button, which is the button with the plus sign (+).

Deleting nutrients
To delete a nutrient, first select the nutrient from the nutrient drop-down box, and then click the Delete button, which is the button with the symbol X. The Delete button permanently removes a nutrient from the database. Instead, you can make the nutrient invisible, as explained next.

Visibility
Check the “Visible on screen” box if you want this nutrient to appear in other windows, and check the “and in reports” box if you want this nutrient to appear also in printed reports. If you clear (un-check) the Visible on screen box, this nutrient will only appear in this window (The Nutrients window) and in the two windows opened with the By Ingredient and By Nutrient buttons of the main menu. A nutrient that is visible in printed reports is also visible on screens.

Formula types
A nutrient can be “visible on screen and in reports” and still not appear in some formula windows and reports if the formula type of the formula does not include the nutrient. See the topic “Formula types tell which nutrients are visible” in Nutrients Help, and “Select nutrients for this formula” in Formulas Help.

Nutrient names

There are two nutrient names, a Short name and a Long name. These names can be letters, numbers or other symbols including spaces. The short name of a nutrient is 1 to 32 characters long. You will see the short names of nutrients in drop-down boxes, tables, and printed reports.

Long names
The long name of a nutrient is 1 to 64 characters long. You can use the long name for a comment about the nutrient. The main use for long nutrient names is the guaranteed analysis statement of a feed label (see “The guaranteed analysis statement” in Feed Labels Help.)

Printing names and ID codes
You can print nutrient short names and ID codes from main menu by clicking the By Ingredient button, the Print/Save button (the button with the lock), and the Print button (the button with the printer.)

Sequence numbers and ID codes

Nutrient sequence numbers determine the order in which nutrients appear in drop-down boxes, tables and printed reports. Assign each nutrient a sequence number between 1 and 32000. You may find it convenient to use sequence numbers to group the nutrients by type. For example, place the energy nutrients first and the protein nutrients second, followed by nutrients for fat, fiber, minerals, vitamins, and amino acids.

ID codes
An ID code is a 16-character name, consisting of letters A-Z and numbers 0-9, which identifies the nutrient. Different nutrients should have different ID codes. Nutrient ID codes are used to transfer formulas between databases (see “Sending and receiving formulas” in Options Help.) Nutrient ID codes are printed by clicking the By Ingredient button, the Print/Save button (the button with the lock) and the Print button (the button with the printer.)

Formula types tell which nutrients are visible

MIXIT-WIN lets you create rations for many different types of animals, as well as for premixes and general blends. MIXIT-WIN also lets you create many different types of nutrients. Not all nutrients, however, are used with every type of ration. For example, the nutrient TDN is used in beef and dairy rations but not in poultry rations, whereas the nutrient Protein appears in all three.

MIXIT-WIN has a feature called formula type that lets you specify the nutrients that you want to see with each type of ration (see “Select nutrients for this formula” in Formulas Help.) There are 31 formula types with names like “Beef cattle”, “Dairy cattle”, “Swine”, “Poultry”, “Mineral premixes”, etc. With each formula type is associated a set of nutrients belonging to this formula type. You can change the formula type names and the sets of nutrients that belong to each formula type, as described in the following topic “Change the formula types.”

Changing formula types

MIXIT-WIN has a feature called formula type that lets you specify the nutrients that you want to see with each type of ration (see the previous topic “Formula types tell which nutrients are visible.”) You can change formula type names and nutrients as shown below.

In the Nutrients window, click the Change button (the button with the pencil) and another window appears. This window lets you change the names of the formula types, and also provides a convenient way to select the nutrients that appear with each formula type.

From the drop-down Select box, select a formula type. You change the name of this formula type by entering a new name (up to 50 characters) in the Change usage names

box. By clicking with the mouse, you select or deselect the nutrients that will appear in rations with this formula type. (You can also select and deselect the nutrients with the UP, DOWN and SPACEBAR keys.)

Nutrient units and daily units explained

A “nutrient unit” defines how a nutrient is measured. Some examples of nutrient units are percent (%), kilocalories per pound (kcal/lb), and parts per million (ppm). Nutrient units are used in describing ingredients as well as rations, which are mixtures of ingredients.

Daily amounts
The “daily amount” of a nutrient is the number of grams, kilograms or pounds of the nutrient that an animal requires or consumes in one day. The daily amount that an animal consumes depends on the nutrient content of the ration and the animal’s daily intake.

Daily units
The “daily unit” is how the daily amount of a nutrient is measured. Some examples of daily units are grams per day (g/day), mega calories per day (mcal/day), and international units per day (IU/day). Daily units are used for rations and do not apply to ingredients.

For example
A cow whose dry matter intake (DMI) is 23 kg/day consumes 2.3 kg/day of protein from a diet of hay that is 10% protein on a dry matter basis, as shown below.

Protein in wet hay	Protein in dry hay
2300 grams protein	2300 grams protein
23 kilograms dry matter	23 kilograms dry matter
23 kilograms water	0 kilograms water
5% protein (as fed)	10% protein (dry m.)
2.3 kg/day	2.3 kg/day

Selecting nutrient units and daily units

The nutrient unit and the nutrient unit per day are shown in the two boxes to the right of the Units label in the Nutrients window. The nutrient unit applies to every ingredient and to every formula in which this nutrient is visible. The nutrient unit per day applies to every formula in which this nutrient is visible.

If the units are not correct, click the Select drop-down box and choose a nutrient unit and daily unit pair. Instead of selecting a pair in the drop-down box you can enter a nutrient unit name (8 characters) in the Select box. The consequence of entering your own nutrient unit is explained below.

Entering your own nutrient unit

When you choose a nutrient unit and daily unit pair (for example, % and mcal/day) MIXIT-WIN uses an internal table, called the “daily factor table”, to convert intake units (like kg/day) to daily units (like mcal/day). Instead of choosing a pair from the list, you can also enter your own unit name (8 characters.) When you enter your own unit name, however, MIXIT-WIN will show a daily amount of zero for this nutrient. (See “The daily factor table” in Options Help for a way to enter your own units into the daily factor table.)

Nutrient amounts of ingredients

A “nutrient amount” is a number that represents how much of a nutrient is found in an ingredient. Each ingredient has an amount of each nutrient, and a zero nutrient amount is used if the amount is zero or unknown. The table of nutrient amounts, with ingredients as rows and nutrients as columns, is called the master ingredient list. You change nutrient amounts in the master ingredient list by clicking the By Ingredient or By Nutrient button in the main menu.

Tables of nutrient amounts

The nutrient amounts in the master ingredient list should be verified by comparison with tabulated data, and actual analysis should be obtained and used whenever possible. Some sources of tabulated data are shown below.

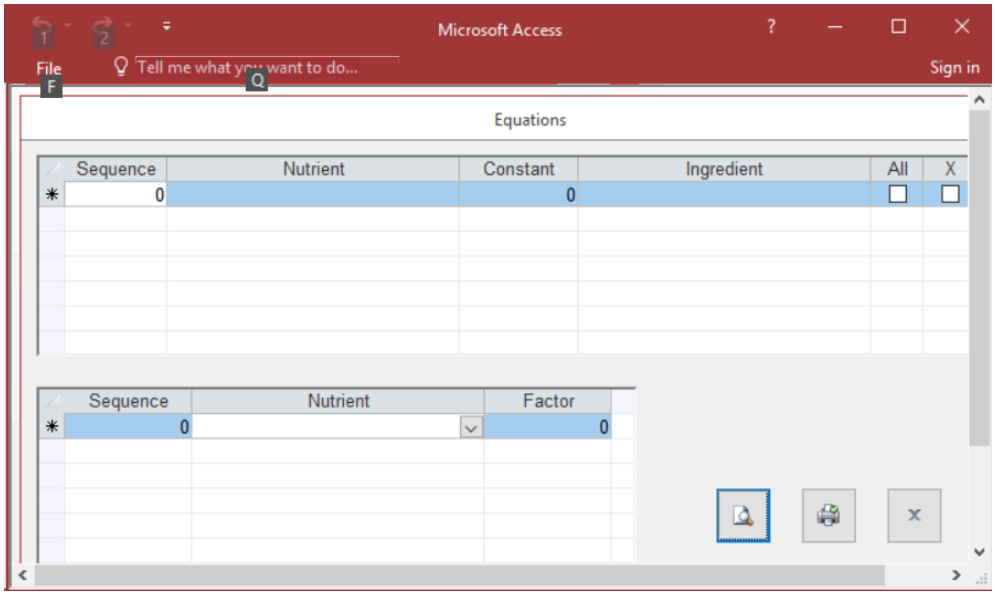
“United States-Canadian Tables of Feed Composition” by National Academy Press. (out of print)

“Nutrient Requirements of Domestic Animals” by National Academy Press. (telephone 1-800-624-6242)

“Feedstuffs Reference Issue” by Feedstuffs, a weekly newspaper for agribusiness. (telephone 1-952-931-0211)

“Feed Industry Red Book” by Communications Marketing, Inc. (telephone 1-612-941-5820)

Nutrient Equations



A nutrient equation is a function that changes the value of a nutrient N1 of an ingredient based on the values of other nutrients N2, N3, … of the ingredient. Each nutrient equation has one of two forms. The first form involves the addition of nutrient amounts.

N1 = F2*N2 + F3*N3 + ... + Fn*Nn + Constant

The second form involves the multiplication of nutrient amounts.

N1 = F2*N2 * F3*N3 * ... * Fn*Nn + Constant

In each form, N1 is the nutrient value that is calculated from other nutrient values (N2, N3,..., Nn) that are multiplied by numbers (F2, F3,..., Fn.)

Division and subtraction
Although only multiplication and addition appear in a nutrient equation, division and subtraction can also be accomplished, since dividing by F is the same as multiplying by 1/F, and subtracting F*N is the same as adding -F*N. In each form, the constant term (which can be positive, negative or zero) is added to the sum or product.

Examples
The following functions are NOT in the form of nutrient equations.

1. Cation Balance = [(Na% * 43.5) + (K% * 25.6)] - [(Cl% * 28.2) + (S% * 62.6)]

2. NFC% = 100 - (NDF% + CP% + Ash% + Fat%)

3. Lysine = 0.0579*(CP% + 1.1485*Ash%) - 0.113

4. CP% = IP% + 0.5 * (UIP% / 0.33 - IP%)

5. Total UIP = CP% * UIP%

Nevertheless, they can be rewritten in the form of nutrient equations, as shown below.

1. Cation Balance = 43.5*Na% + 25.6*K% + (-28.2)*Cl% + (-62.6)*S% + 0

2. NFC% = (-1)*NDF% + (-1)*CP% + (-1)*Ash% + (-1)*Fat% + 100

3. Lysine = 0.0579*CP% + 0.0665*Ash% - 0.113

4. CP% = 0.5*IP% + 1.5151515*UIP% + 0

5. Total UIP = 1*CP% * 1*UIP% + 0

Using nutrient equations

ome nutrient equations apply to all ingredients and some apply to a single ingredient. A nutrient equation that applies to all ingredients also applies to any new ingredient that is added later. For example, equations 1 and 2 could apply to all ingredients, whereas equation 3 could apply only to Soybean 44%.

Sequence numbers

Each nutrient equation has a unique “sequence number,” which is an integer between 1 and 32000. When several nutrient equations are applied to the same ingredient, they are applied in the order of their increasing sequence numbers. In general, sequence numbers of equations that apply to all ingredients should be smaller than sequence numbers of equations that apply to single ingredients. In this way, an equation that applies to a single ingredient will override an equation that applies to all ingredients.

For example, suppose equations 3 and 4 are applied to the ingredient Alfalfa, and the sequence numbers of these two equations are 300 and 350, respectively. This means the Lysine equation is applied before the CP% equation.

(300) Lysine = 0.0579*CP% + 0.0665*Ash% - 0.113

(350) CP% = 0.5*IP% + 1.5151515*UIP% + 0

If you want a change in IP% to change CP%, and have this new value of CP% in turn change Lysine, you should interchange the sequence numbers of these equations.

Applying nutrient equations

After making one or more nutrient equations (see the next topic “Making nutrient equations”) it is easy to apply these nutrient equations to an ingredient. To apply the nutrient equations, click the By Ingredient button in the main menu of MIXIT-WIN. Select an ingredient in the drop-down box, and click the Equations button (the button with three small rectangles that is next to the Exit button.)

Seeing nutrient equations

You can see how many equations apply to the selected ingredient by looking below the ingredient drop-down box. For example, you may have selected Alfalfa meal 17% and the words “2 Equations 1 All” appear below the ingredient drop-down box. These words tell you that two equations apply to Alfalfa meal 17% and one of these two equations applies to all ingredients. Of course, the other equation applies only to Alfalfa meal 17%.

Undoing nutrient equations

When you click the Equations button you will see the sequence numbers of the equations and have an opportunity to stop before applying the equations. After applying the equations, the Equations button turns into an Undo button that can restore the previous nutrient values. (WARNING: This is your only opportunity to restore the previous values since any change you make afterwards will remove the Undo button.)

Making nutrient equations

To make or change nutrient equations, click the Nutrients button in the main menu of MIXIT-WIN. Click the Equations button (the button with three small rectangles) and the Equations window appears. This window has two datasheets, where you enter the equations, and three buttons to preview the equations, print the equations, and exit.

Seeing all equations

The upper datasheet shows all of the equations: their sequence number (in the Sequence box), the calculated nutrient (in the Nutrient box), the constant term (in the Constant box), and the affected ingredient (in the Ingredient box). If this equation applies to all ingredients, check the All box; and if you want to use the second form of the equation in which the nutrient amounts are multiplied instead of added, check the X box.

Details of one equation

The lower datasheet shows the details of the equation that is currently selected in the upper datasheet: the nutrient names and multiplication factors. You select an equation by clicking a row in the upper datasheet, and the details of this equation are automatically entered into the lower datasheet. For an explanation of nutrient equations see the earlier topics “Overview” and “Using nutrient equations.”

An example of nutrient equations

The following two tables represent the upper and lower datasheets of the Equations window. The upper datasheet shows four nutrient equations that apply to the ingredients Alfalfa meal, Casein dehydrated and Soybean seeds. The first nutrient equation (with sequence number 22) applies to all ingredients and not just to Alfalfa meal because there is a check mark in the All column. (You always enter an ingredient name in the Ingredient column, even when the equation applies to all ingredients.) All four equations use the first form of the equation (in which terms are added) because the boxes in the X column are cleared. The sequence numbers show the order in which these four equations are applied: the Protein equation first, the DE Swine equation second, the Calcium equation third and the Lysine equation fourth.

Sequence	Nutrient	Constant	Ingredient	All	X
22	Protein	22	Alfalfa meal	check	
50	DE Swine	25	Alfalfa meal		
100	Calcium	10	Casein dehy.		
130	Lysine	-0.113	Soybean seeds		
0	0				

Sequence	Nutrient	Factor
130	Protein	0.0579
130	Ash	0.0666
130	0	

The lower datasheet shows the following nutrient equation for Lysine. (Click in the Lysine row of the upper datasheet to see details of the Lysine equation in the lower datasheet.)

Lysine = 0.0579*Protein + 0.0665*Ash - 0.113

The upper datasheet shows that the sequence number of the Lysine equation is 130, and the Lysine equation only applies to Soybean seeds since its All box is cleared.

The Protein equation with sequence number 22 applies to all ingredients, since its All box is checked. Since nutrient equations are applied in the order of their sequence numbers, the ingredient Soybean seeds meal 44% will be changed first by the protein equation (sequence number 22 that applies to all ingredients) and next by the Lysine equation (sequence number 130 that applies to only Soybean seeds meal 44%.)

Creating a new equation

You create a new equation by entering a sequence number in the bottom row of the upper datasheet (sequence numbers must be unique) and selecting a nutrient name and an ingredient name from the Nutrient and Ingredient boxes. When you click a Nutrient or

Ingredient box, a down arrow appears at the right side of the box; click this down arrow and select a name from the box. (NOTE: you must select an ingredient name in the Ingredient box even if you want the equation to apply to all ingredients.)

Enter the constant term, and check the All box if you want this equation to apply to all current ingredients and any new ingredients you add later. Clear (un-check) the X box in order to use the first form of the equation:

N1 = F2*N2 + F3*N3 + ... + Fn*Nn + Constant <== amounts are added

and check the X box to use the second form:

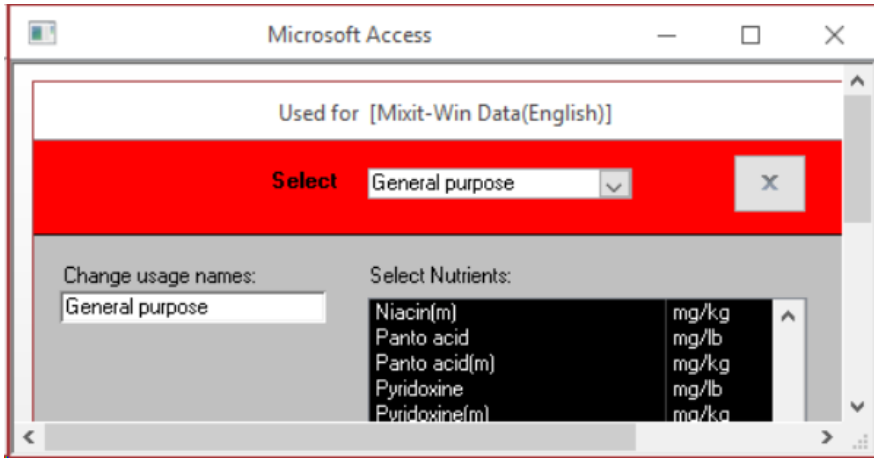
N1 = F2*N2 * F3*N3 * ... * Fn*Nn + Constant <== amounts are multiplied

The name X is supposed to remind you of multiplication.

Details of an equation
After creating a new equation, you enter the details of this equation in the lower datasheet. (An equation with no details is deleted when you exit the Equations window.) You enter a detail by selecting a nutrient name from the Nutrient box in the bottom row and entering the multiplication factor in the Factor box. There is no limit to the number of equations you can create or the number of details a single equation can have.

Changing an equation
You change an equation by changing any item of this equation in the upper or lower datasheet. You add a detail to an equation by selecting a nutrient in the bottom row of the lower datasheet. You delete an equation or a detail of an equation by clicking the gray box to the left of the sequence number (this highlights the row) and pressing the DELETE key on the keyboard. Deleting an equation automatically deletes the equation's details.

Change usage names - Changing formula types

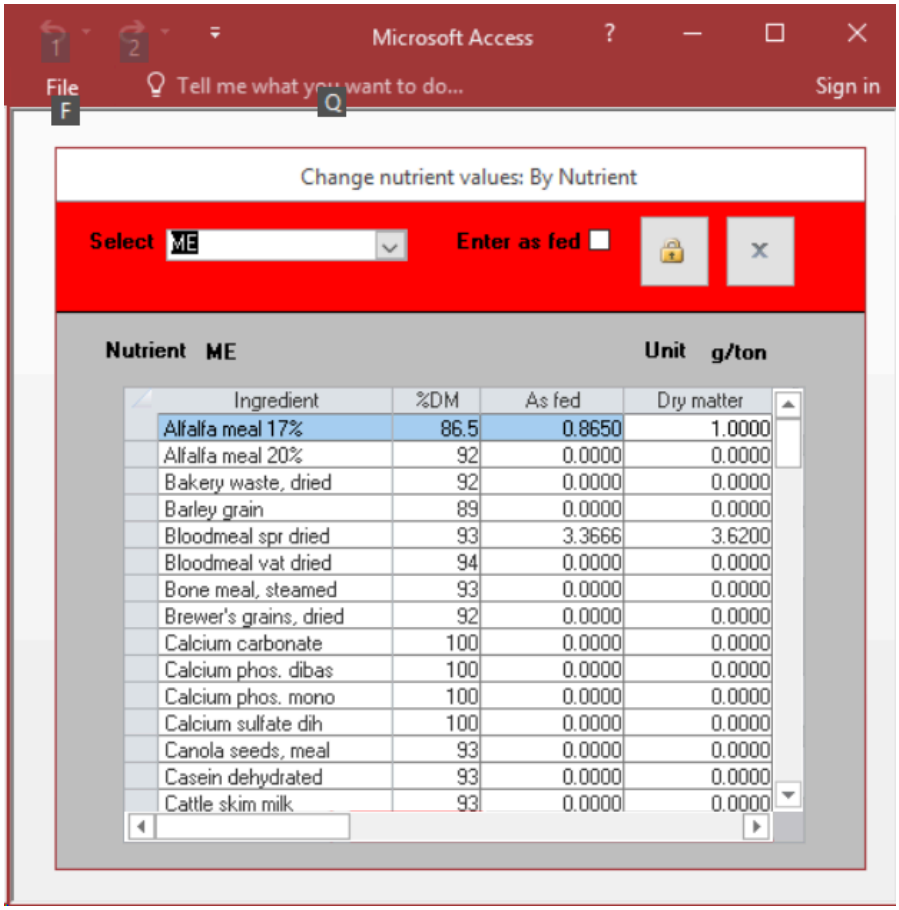


MIXIT-WIN has a feature called formula type that lets you specify the nutrients that you want to see with each type of ration (see the previous topic “Formula types tell which nutrients are visible.”) You can change formula type names and nutrients as shown below.

In the Nutrients window, click the Change button (the button with the pencil) and another window appears. This window lets you change the names of the formula types, and also provides a convenient way to select the nutrients that appear with each formula type.

From the drop-down Select box, select a formula type. You change the name of this formula type by entering a new name (up to 50 characters) in the Change usage names box. By clicking with the mouse, you select or deselect the nutrients that will appear in rations with this formula type. (You can also select and deselect the nutrients with the UP, DOWN and SPACEBAR keys.)

By Nutrient



Changing values by nutrient

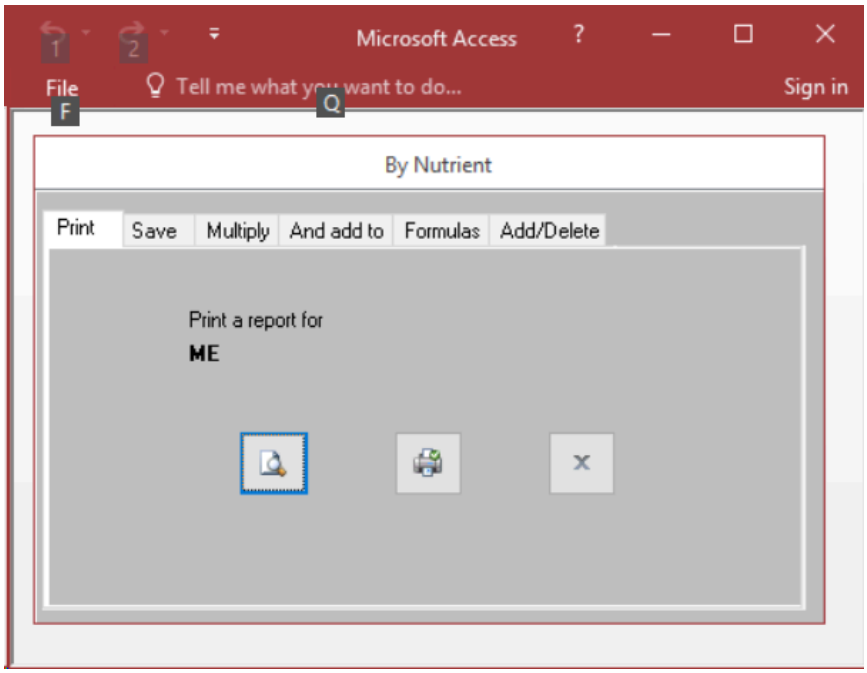
To change the nutrient amounts of ingredients in the master ingredient list, click the By Nutrients button in the main menu.

The Enter as fed box
This window has a drop-down box, a table, a check box, and two buttons. Choose a nutrient from the drop-down box, and enter the nutrient amounts for each ingredient in the Dry matter column of the table. You can enter these values on an as fed basis if you check the “Enter as fed” box. The values that you enter are automatically saved.

The Dry matter column
Always enter nutrient amounts in the “Dry matter” column of the table, even if you check the As Fed box. MIXIT-WIN calculates the correct amounts to be entered into the As Fed and Dry Matter columns based on the dry matter percentage of the ingredient (see “Dry matter % of an ingredient” earlier in Ingredients Help.)

The Print/Save button (the button with the padlock) is explained in the following topic.

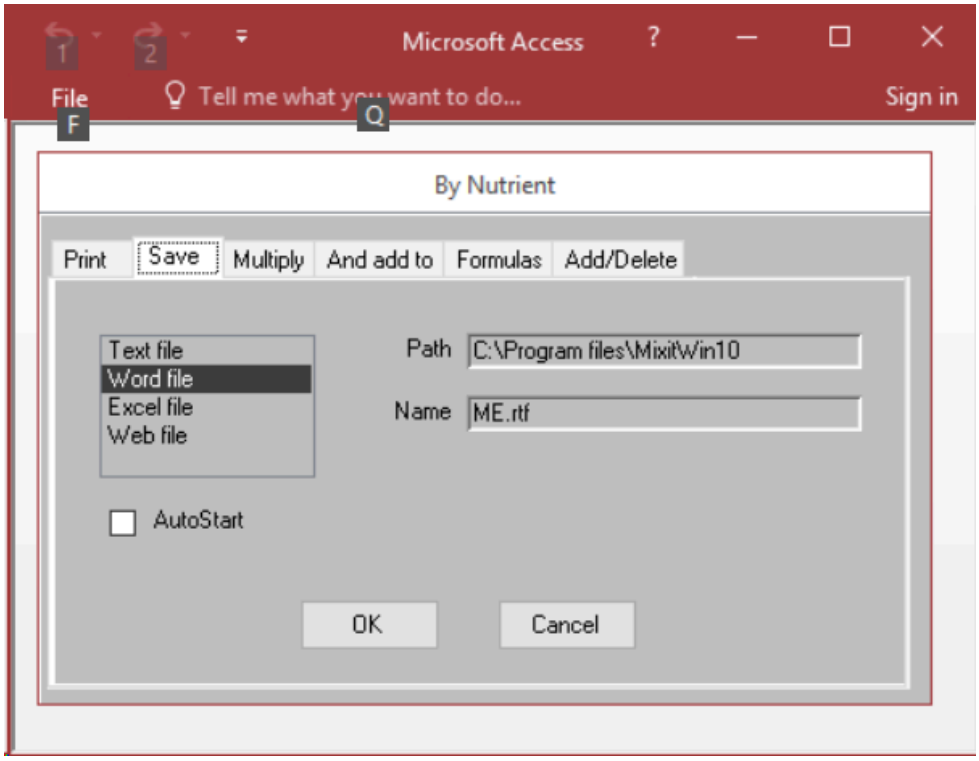
The Print/Save button



Click the Print/Save button (the button with the padlock) and a window with six tabs appears. These tabs will print or save the nutrient that was selected in the previous window, multiply a nutrient by a number, multiply a nutrient by a number and add it to another nutrient, find formulas with the selected nutrient, and add or delete the selected nutrient in many formulas.

Printing ingredient names and ID codes
Select the Print tab to see or print the nutrient that was selected in the previous window. Click the Preview button or the Print button to see or print the selected nutrient with all ingredient names and amounts. This is a way to print all ingredient names and ID codes in the current database (see Databases Help.).

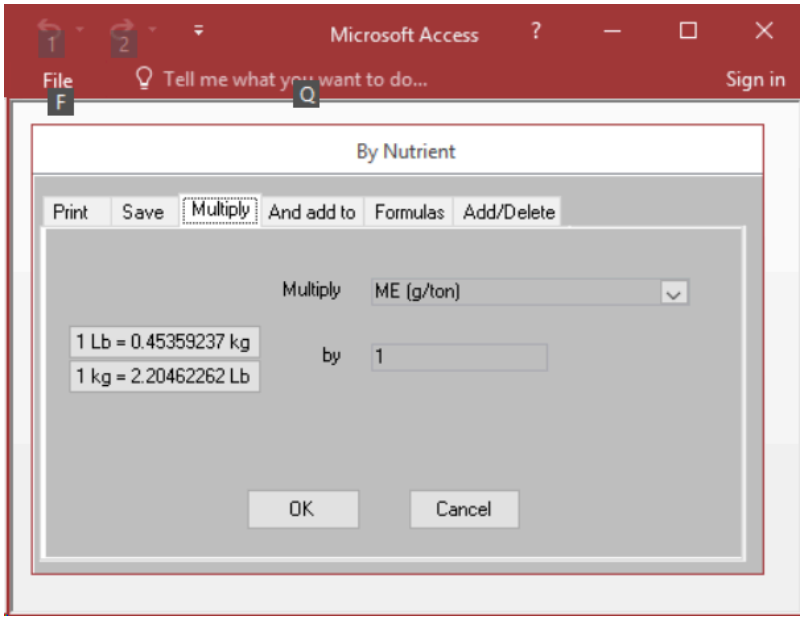
Saving ingredient names to a disk file



Select the Save tab to save the selected nutrient with all ingredient names and ID codes to a disk file. In the list box, click Text file to save the names as a file that can be seen in Microsoft NotePad, or click Rich Text Format file to save the names as a file that can be opened in Microsoft Word. In the Path box, enter the location of the saved file.

For example, Enter A: to save to a disk in drive A, or C:\Program Files\MixitWn6 to save to the folder MixitWn6 which is under the folder Program Files on drive C. In the Name box, enter the name of the file that will be saved. Click the OK button to save the file. If the AutoStart box is checked, clicking the OK button saves the file and automatically opens it in NotePad if Text file was selected, and in Word if Rich Text Format file was selected.

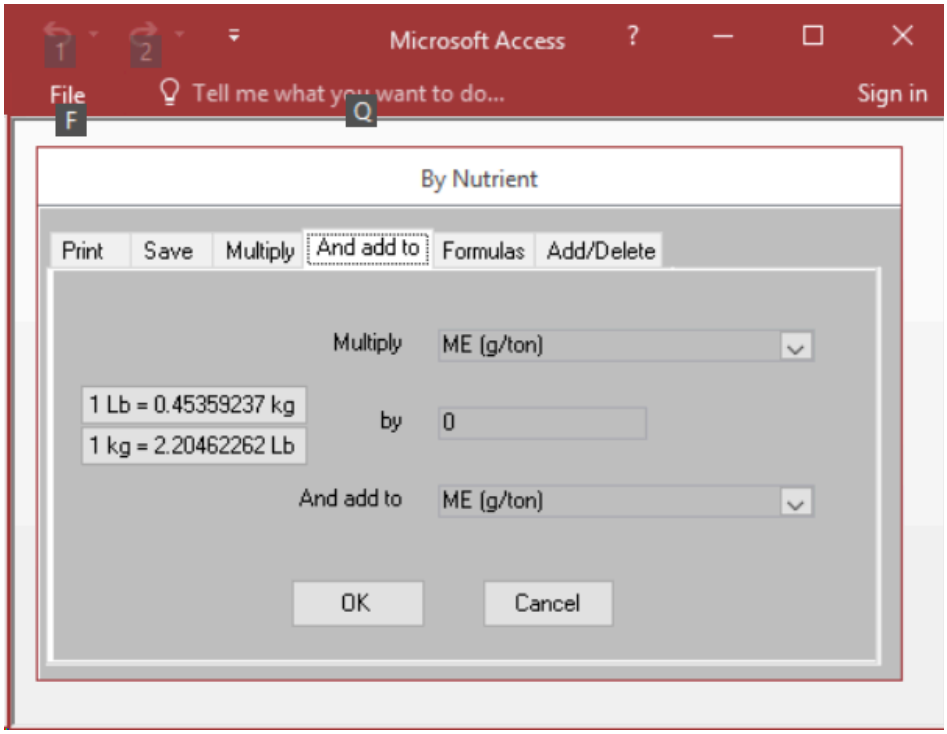
Multiplying a nutrient by a number



Select the Multiply tab to multiply a nutrient amount (for all ingredients) by a number. Select a nutrient from the drop-down box, enter the number in the “by” box, and click the OK button. This can be used to change a nutrient between the metric system and the American system.

For example, suppose you want to convert the nutrient Vitamin E from mg/lb to mg/kg. To do this you must change the units of Vitamin E from mg/kg to mg/lb, and then multiply the amount of Vitamin E in each ingredient by 0.4536. The way to change the units of Vitamin E is described in the earlier topic “Selecting nutrients unit and daily units.” You multiply the amount of Vitamin E in each ingredient by selecting Vitamin E from the Multiply drop-down box, entering the conversion number, and clicking the OK button. Click the 1 Lb = 0.45359237 kg button to enter the exact number of kilograms in one pound.

Multiplying and adding to another nutrient

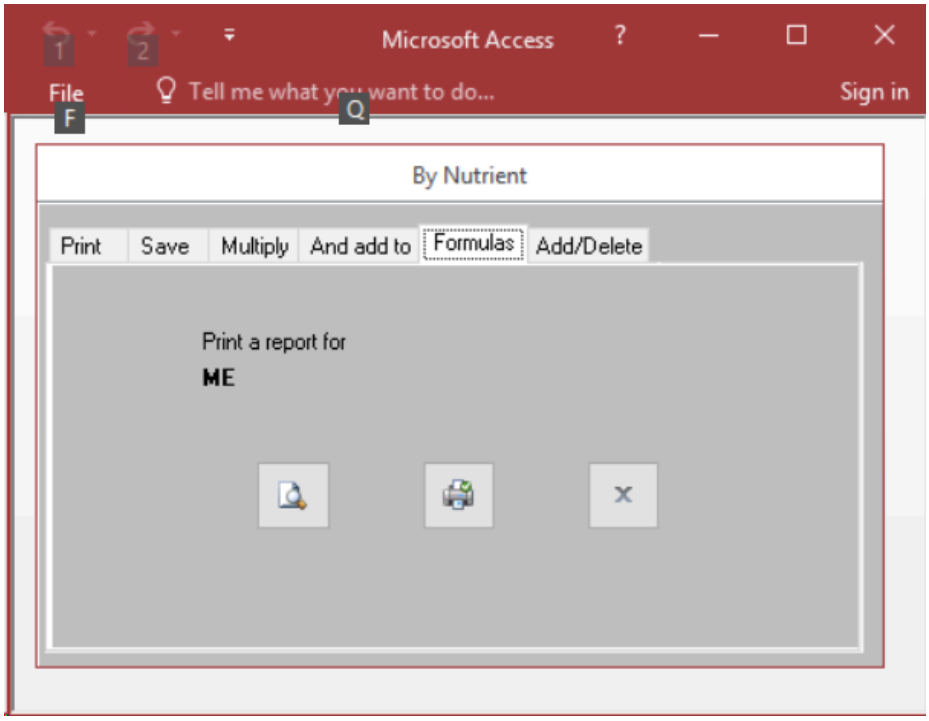


Select the “And add to” tab to multiply a nutrient amount (for all ingredients) by a number and add the result to another nutrient. Only the second nutrient is changed, the first nutrient is not affected.

For example, suppose you have two nutrients, “Methionine” and “Cystine,” and you want to create a third nutrient called “Methionine + Cystine.” The first step is to create the nutrient “Methionine + Cystine” as described in the topic “Selecting, adding and deleting nutrients.” (In case there is already a nutrient with the name “Methionine + Cystine,” you should start by multiplying the nutrient amount of “Methionine + Cystine” by the number 0, which is described in the topic “Multiply a nutrient by a number.”)

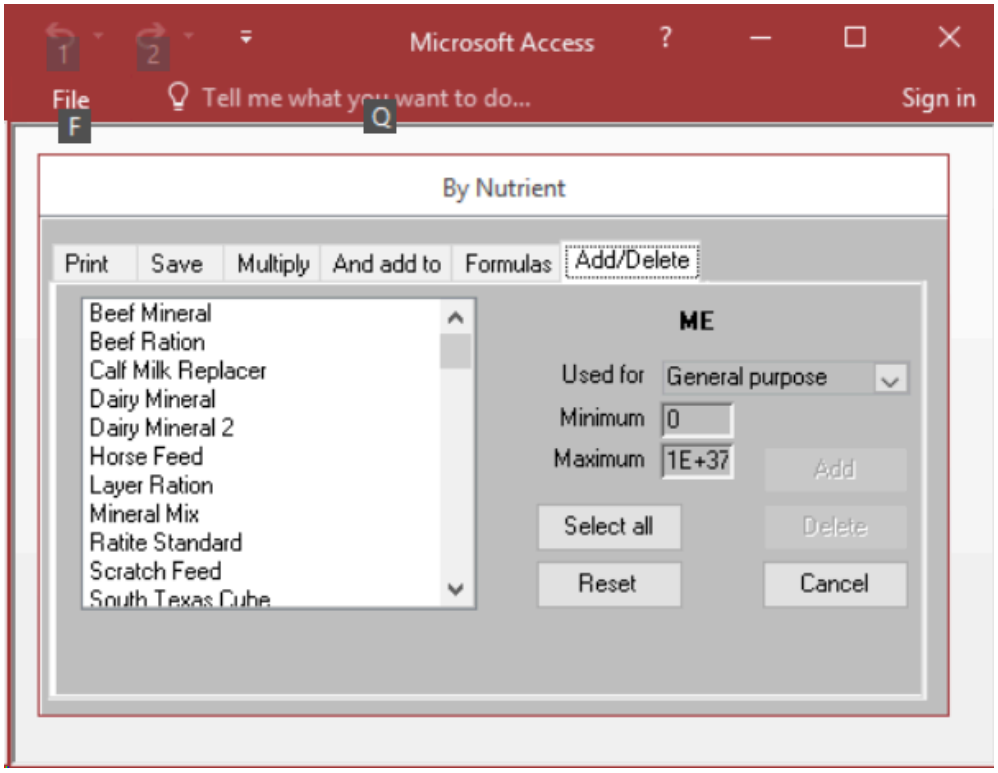
Next, select “Methionine” from the “Multiply” box, enter 1 in the “by” box, select “Methionine + Cystine” from the “And add to” box, and click the OK button. Finally, select “Cystine” from the “Multiply” box, enter 1 in the “by” box, select “Methionine + Cystine” from the “And add to” box, and click the OK button.

Finding formulas that have a selected nutrient



Select the Formulas tab to find all formulas that use the nutrient (that was selected in the previous window) in calculating a balanced ration. Use the Preview or Print buttons to see or print the formulas with the minimum and maximum constraints of the selected nutrient as well as the amount of the nutrient in the balanced ration. This tab gives useful information when you are in the Add/Select folder, which is described in the next section.

Adding or deleting nutrients in many formulas



Select the Add/Delete tab to add the nutrient (that was selected in the previous window) to many balanced rations, or delete it from many balanced rations (see Balance This Formula Help.)

When you add a nutrient to a balanced ration, the nutrient will be available the next time you calculate a balanced ration for this formula. When you delete a nutrient from a formula, it will not appear the next time you calculate a balanced ration for this formula. That is, adding or deleting a nutrient only affects the next balanced ration.

How to select formulas

There are three ways to select the formulas that the nutrient will be added to or deleted from. You select (or deselect) formulas by clicking their names with the mouse in the list box. You can select all formulas by clicking the Select all button, or deselect all formulas by clicking the Reset button. Finally, you can select formulas of a particular formula type by selecting the formula type in the Used for drop-down box.

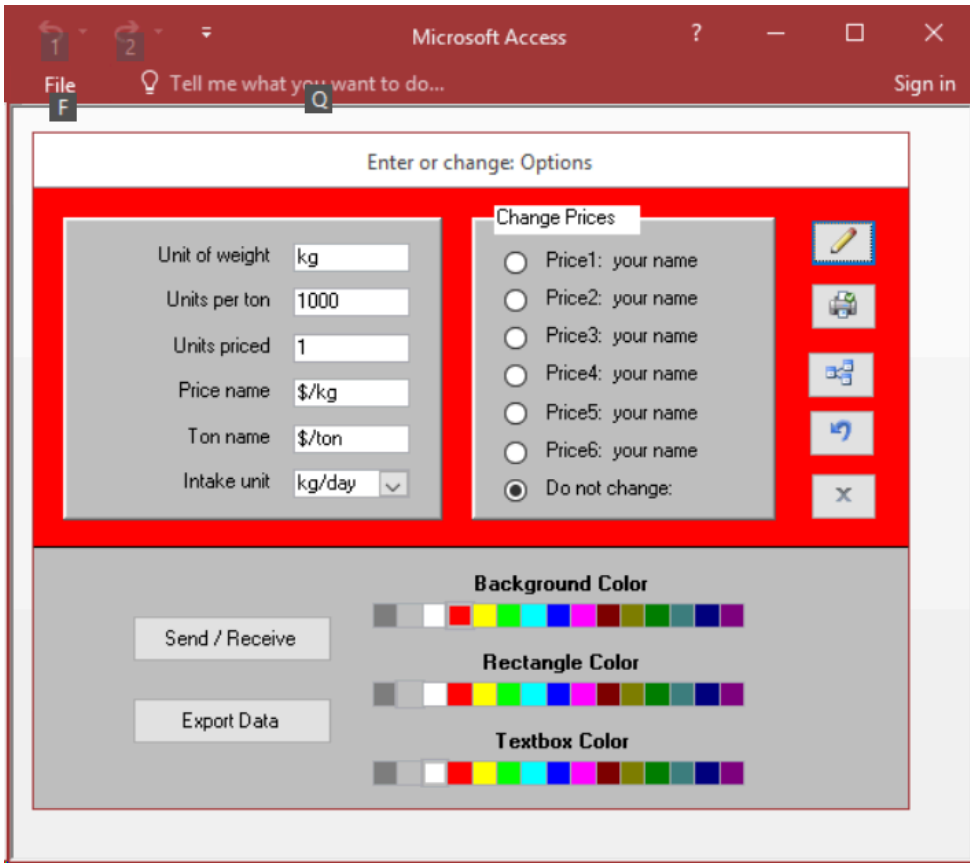
Minimum and maximum amounts

After selecting the formulas, change the minimum and maximum amounts of this nutrient, and then click the Add button. The minimum and maximum amounts are used for all of the selected formulas. The Formulas tab, described in the preceding topic, gives useful information about the formulas that contain this nutrient.

Options

MIXIT-WIN can use the American or metric system. Ingredient prices are copied, selected and updated, or changed with price equations. Window colors are selected, and the daily factor table modified. You can send formulas to another MIXIT-WIN program, receive formulas from another MIXIT-WIN program, and export data to text files and spreadsheets. All of these tasks are done in the options window.

The options window



Click the Options button in the main menu and the options window appears. This window has three sections and seven buttons. The section in the upper left part of the window changes the units of weight and price. This section has six boxes that define the unit of weight, price units and intake unit that are used in all windows and printed reports of MIXIT-WIN. The section in the upper right part of the window selects one of the six sets of ingredient prices, and the section in the lower right part of the window changes the colors you see in the windows of MIXIT-WIN.

The options buttons

There are five buttons in the upper right part of the window. The highest button updates all ingredient prices, the second button prints and copied prices, and the third button

changes prices with equations. The next button is the Undo button (the button with the curved arrow) that you click to recover the units, prices, and colors that were in effect when you opened the options window. Click the Exit button (the button with an arrow pointing to an open door) to return to the main menu of MIXIT-WIN.

The two buttons in the lower left part of the window send and receive formulas, and export formulas, ingredients and nutrients to text files and spreadsheets.

Selecting window colors

At the bottom of the options window are the boxes in which you select colors for the background, rectangles, and text boxes in most of the windows of MIXIT-WIN. Click a color box to change a color. Some colors are changed in Windows itself (Start ==> Control Panel ==> Appearance and Themes.)

The colors that you select will be applied the next time you start MIXIT-WIN. Click the Undo button (the button with the curved arrow) to recover the units, prices, and colors that were in effect when you opened the options window.

Units and prices

Metric units and American units

Choose an American system, a metric system, or another system. The following table shows the American hundred-weight (CWT) system and three other systems. You can use one of these systems or any other system as long as (1) ‘Units per ton’ and ‘Units priced’ refer to the same ‘Unit of weight’, (2) ‘Price name’ is consistent with ‘Units priced’, and (3) ‘Ton name’ is consistent with ‘Units per ton’.

UNITS	American $/CWT	American $/TON	Metric $/KG	Metric $/TONNE
Unit of weight	LB	LB	KG	KG
Units per ton	2000	2000	1000	1000
Units priced	100	2000	1	1000
Price name	$/CWT	$/TON	$/KG	$/TONNE
Ton name	$/TON	$/TON	$/TONNE	$/TONNE
Intake unit	LB/day	LB/day	KG/day	KG/day

After changing the system units, you must immediately exit from the options window for the new units to be saved.

Price units

The nutrient units and daily units you select in the nutrients window are independent of the unit of weight and intake unit you select in the options window (see “The daily factor table.”) On the other hand, the prices you enter in the options window and elsewhere must be consistent with the ‘Price name’ and ‘Units priced’ you select in the options window.

Sets of ingredient prices

Ingredient prices

MIXIT-WIN uses ingredient prices to show formula prices and to find balanced, least-cost rations. These prices are called the ‘current ingredient prices’. Current ingredient prices are temporary prices, and they can be changed in several windows of MIXIT-WIN. In addition to the current ingredient prices, MIXIT-WIN saves six other sets of ingredient prices that you can use for various purposes such as the current prices of your ingredients, their wholesale or retail prices, or prices at different locations. (The Clients program saves hundreds of sets of ingredient prices for different customers or locations.)

Alternate ingredient prices

The six sets of ingredient prices that MIXIT-WIN saves are Price1, Price2, Price3, Price4, Price5, and Price6. (You enter alternate price names in the ingredients window by clicking the button with the pencil.) MIXIT-WIN does not calculate ration prices with these six sets of prices; it only saves them for future use. You should, nevertheless, regard these six sets of prices as the correct prices for their purpose and update them on a regular basis. Although you can change the current price of an ingredient in the ingredients window, the best way to update ingredient prices is shown in the topic “Updating ingredient prices.”

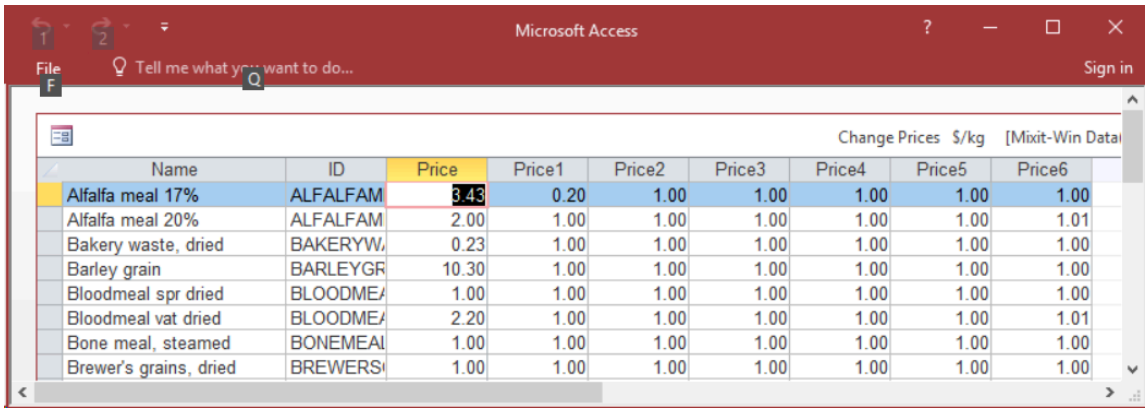
Current prices

The current ingredient prices can be changed in many ways, and may not be the correct wholesale, retail or other prices of ingredients. Use the section in the upper right part of the options window to select one of the six sets of ingredient prices. Select a price box and these prices will replace the current prices after you click the Exit button of the options window. Select the ‘Do not change’ box and the current prices will not be changed. The Undo button (the button with the curved arrow) recovers the units, prices, and colors that were in effect when you opened the options window.

Replacing prices

When you select a price box and click the Exit button, all of the current ingredient prices are replaced by the prices that you select, and the current prices are lost! The Undo button will not restore the old ingredient prices after you click the Exit button of the options window. (The topic “Copying ingredient prices” shows how to save the current ingredient prices as one of the six sets of saved prices.)

Updating ingredient prices - the pencil button



Three buttons in the options window change the prices of ingredients. The highest button is the Prices button (the button with a pencil.) Click this button to change the current ingredient prices and the other six sets of ingredient prices. Click a price box to change a price. You can use the UP, DOWN, RIGHT, LEFT, PAGEUP and PAGEDOWN keys on the keyboard to move from box to box.

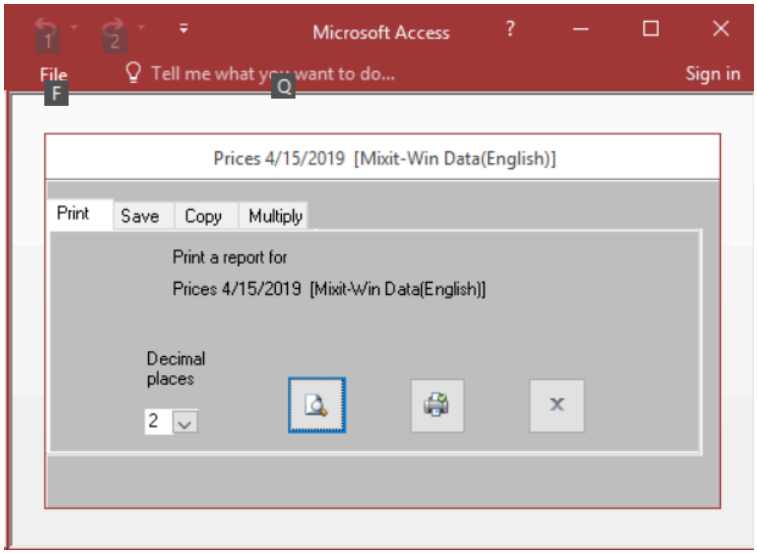
Using correct price units

Enter prices in the same units ($/lb, $/cwt, $/ton, $/kg or $/tonne) that you entered in the 'Price name' box (see the topic "Metric units and American units.")

Alternate prices

For example, Price1 could be the current prices you pay for ingredients and which you use to get least cost rations, and Price2 and Price3 could be wholesale and retail prices that you display on printed reports. You can create wholesale and retail prices from your current prices by means of price equations (see the topic "Changing prices with equations.")

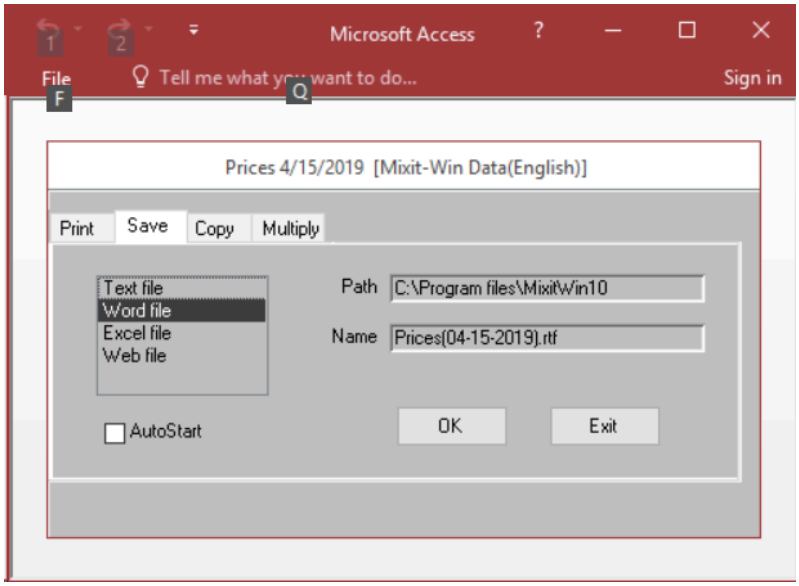
Printing, saving, and copying prices



Printing prices

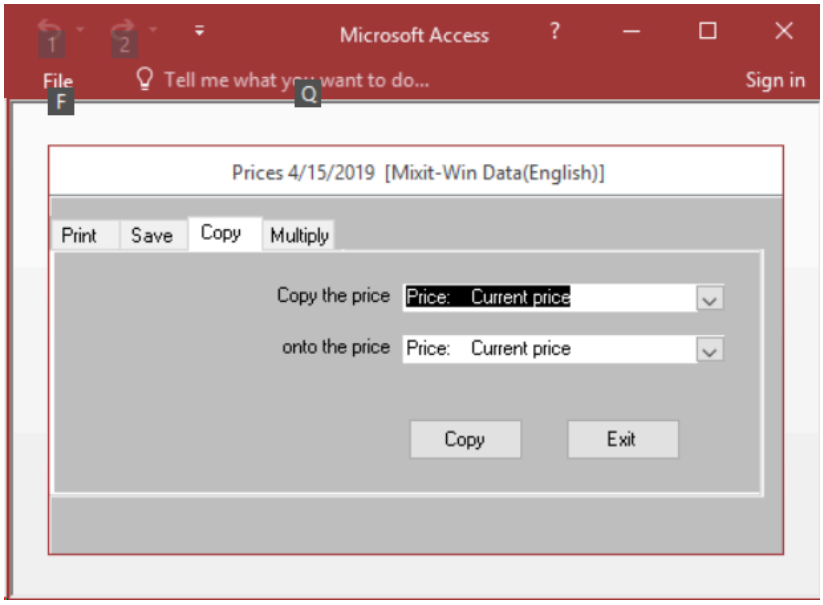
Click the Print button (the button with a printer) in the options window to print, save, copy or multiply ingredient prices. Select the Print tab to print or preview the current ingredient prices and the six sets of saved prices with a selected number of decimal places.

Saving prices



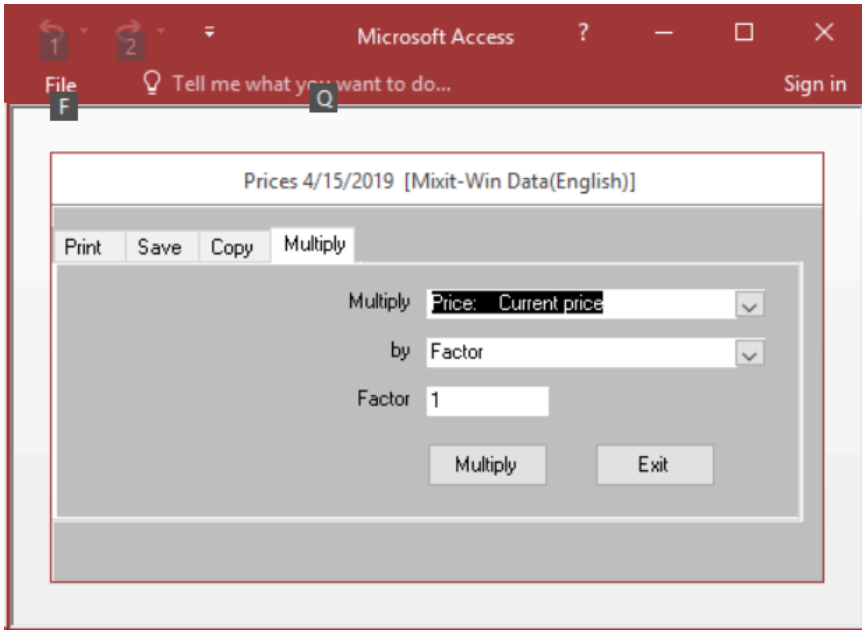
Select the Save tab and click Text file to save the prices in a file that can be seen in Microsoft Notepad, or click Rich Text Format file to save the prices in a file that can be seen in Microsoft Word. In the Path box, enter the location of the saved file.

Copying prices



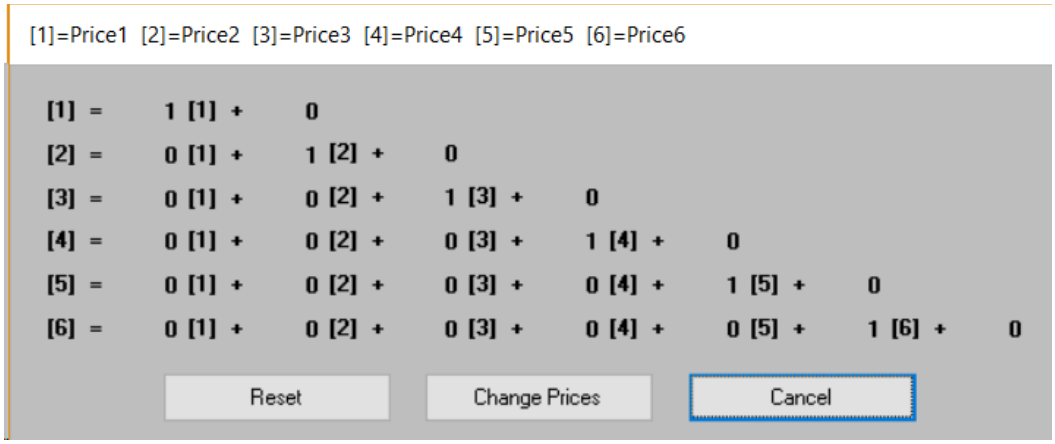
Select the Copy tab to copy one set of prices onto another set of prices. If you use the Inventory program, you can copy the average ingredient prices (Price*) onto another set of prices. In this way, formula prices can be based on prices you paid in the past and not just today's prices. After copying average ingredient prices, you are asked if you want to export this set of prices to a text file.

Multiplying prices



Select the Multiply tab to multiply one set of prices by a number. Select the Price in the "Multiply" box, select Factor in the "by" box, and enter the number in the "Factor" box. You can change as fed prices to dry matter prices by selecting the Price in the "Mutiply" box and "100 / %DM" in the "by" box, or change dry matter prices to as fed prices by selecting the Price in the "Multiply" box and "%DM / 100" in the "by" box.

Changing prices with equations



Three buttons in the options window change the prices of ingredients. Click the Equations button (the button with three connected rectangles) to see six equations that change the six sets of ingredient prices: Price1, Price 2, Price 3, Price 4, Price 5, and Price6. In these equations, [1] means Price1, [2] means Price2, etc.

The first equation is [1] = 1 [1] + 0 which means Price1 = 1*Price1 + 0. This equation says, “Each ingredient in Price1 is given a new price, which is 1 times the old price plus 0.” Multiplying by 1 and adding 0 does not change the Price1 prices.

If you change the coefficients 1 and 0 to 1.5 and 6.25, the first equation would be [1] = 1.5 [1] + 6.25 which means Price 1 = 1.5*Price1 + 6.25. This equation says, “Each ingredient in Price1 is given a new price, which is 1.5 times the old price plus 6.25.” This equation does change the Price1 prices.

Entering coefficients

You enter the coefficients of the six equations by clicking a coefficient with the mouse and typing a number. For example, you can change the coefficients so that the third equation is [3] = 1.2 [1] + 0 [2] + 3.6 + 10 which means Price3 = 1.2*Price1 + 0*Price2 + 3.6*Price3 + 10. This equation says, “Each ingredient in Price3 is given a new price, which is 1.2 times its price in Price1, plus 0 times its price in Price2, plus 3.6 times its price in Price3, plus 10. This equation changes the Price3 prices, but does not change the Price1 and Price2 prices.

After you enter the coefficients of the six equations, press the Change Prices button. Press the Reset button to enter coefficients that will not change the prices, and press the Cancel button to exit without changing prices.

How the equations are applied

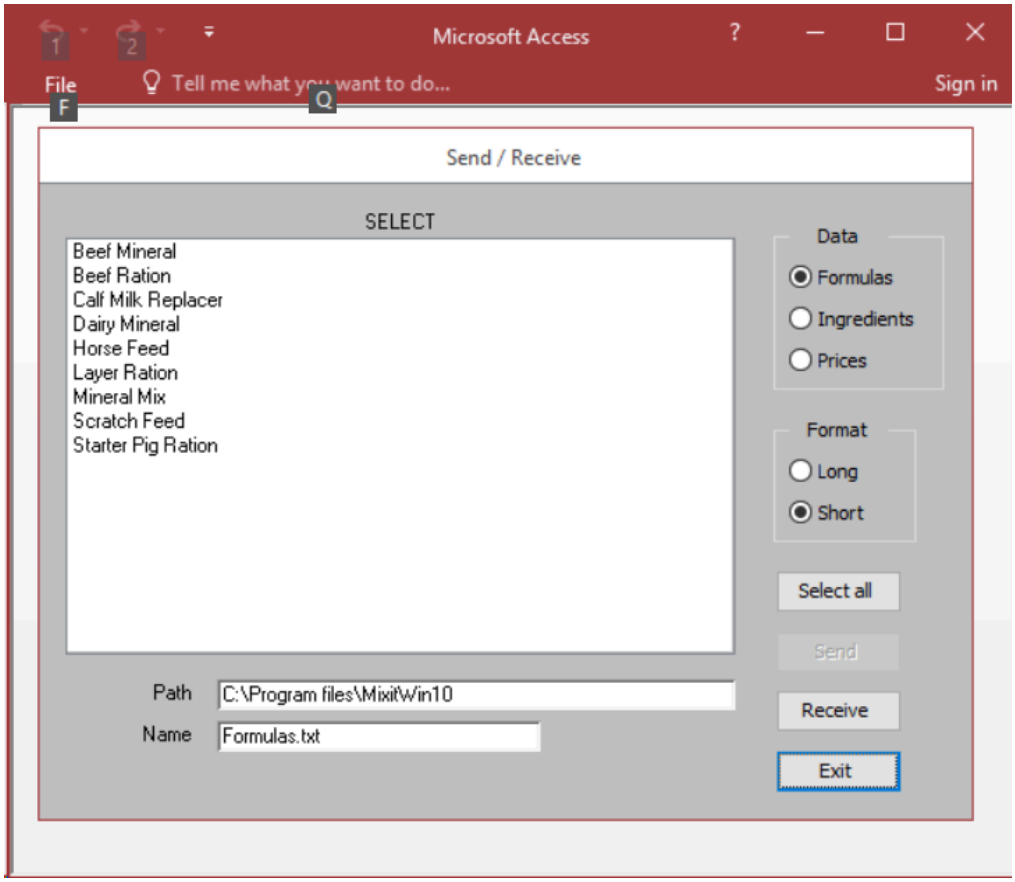
When you press the Change Prices button, the top equation is executed first; the second equation is executed second; the third equation is executed third; and so forth. That is,

the old Price1 prices are used in the top equation to change Price1; the new Price1 prices and old Price2 prices are used in the second equation to change Price2; the new Price1 prices and new Price2 prices and old Price3 prices are used in the third equation to change Price3, and so forth.

Saving the equations

You can change some or all of the 27 coefficients in the Equations window. When you change a coefficient and press either the Change Prices or Cancel button you are asked, “Save the changes?” Answer “Yes” to save the new coefficients, and “No” to keep the previous coefficients.

Sending and receiving formulas



The Send / Receive button in the options window sends formulas to another MIXIT-WIN program and receives formulas that are sent from another MIXIT-WIN program. Feed labels can be sent if the sending program has the Feed Labels program. This is described in “Sending and receiving (Long Format)”.

The Send / Receive button can also send formulas to any program or person and receive formulas that are sent from any program or person. In this case, the other program or person must use a text file with the Short Format as described in “Short Format details”.

Path and filenames
In the Path box enter the name of the folder you will send files to or receive files from. For example: C:\Program Files\MixitWn6

In the name box, enter the name of the text file for formulas (in Short Format) or prices. For example: Formulas.txt or Prices.txt. The names of the text files for formulas in Long Format are shown in “Sending formulas (Long Format)”.

ID codes
A requirement for receiving formulas by a text file is that the ingredients that are involved in the transfer have the same ID codes that are found in the receiving MIXIT-WIN program (see “Ingredients: ID codes and rounding numbers” in Ingredients Help.) When receiving formulas in the Long Format, the nutrients must also have the same ID codes as in the receiving MIXIT-WIN program (see “Nutrients: Sequence numbers and ID codes” in Nutrients Help.)

Sending and receiving formulas

Sending formulas (Long Format)
To send formulas and optionally feed labels, click the Send / Receive button in the options window and select Long Format. Select several formulas by clicking their names in the list box, enter the complete name of a folder (or a drive letter) in the Path box, and click the Send button. The following transfer files are put in the folder (or drive diskette) you entered in the Path box:

XFER_FRM.DAT
XFER_ING.DAT
XFER_NUT.DAT
XFER_RAT.DAT

and XFER_LBL.DAT and XFER_LBN.DAT if you include feed labels.

Receiving formulas (Long Format)
To receive formulas and optionally feed labels, click the Send / Receive button in the options window and select Long Format. Enter the complete name of the folder (or drive letter) that has the transfer files whose names are shown above, and click the Receive button. The name of the received formula is the name of the sent formula with an asterisk (*) added in front.

Sending formulas (Short Format)
To send formulas, click the Send / Receive button in the options window and select Short Format. Select several formulas by clicking their names in the list box. Enter the complete name of a folder (or a drive letter) in the Path box, the name of the text file in the Name box, and click the Send button.

Anyone can send you formulas
Anyone who knows your ingredient ID codes can send you formulas by writing a Short Format text file using Notepad or another word processor. A description of the Short Format is in the topic “Short Format details.”

Receiving formulas (Short Format)
To receive formulas, click the Send / Receive button in the options window and select Short Format. Enter the complete name of the folder (or drive letter) in the Path box, the name of the text file in the Name box, and click the Receive button. The name of the received formula is the sent formula ID code with the date and time added in front.

Short Format details
A text file with the Short Format looks like the following.

F, formula ID code, formula name, 0
I, ingredient ID code, ingredient name, amount
I, ingredient ID code, ingredient name, amount
. . .
I, ingredient ID code, ingredient name, amount
F, formula ID code, formula name, 0
I, ingredient ID code, ingredient name, amount
I, ingredient ID code, ingredient name, amount
. . .
I, ingredient ID code, ingredient name, amount
. . .

The first line starts with F or “F” followed by a formula ID code (up to 16 characters) and a formula name of up to 64 characters. The formula name must be enclosed in double quotation marks (“ “) if it contains a comma; otherwise, quotation marks are optional. The fourth item on the first line is a number which is required but is not used. Commas separate the items on all lines.

Following a formula line are lines that describe the ingredients in the formula. An ingredient line starts with I or “I” followed by an ingredient ID code (up to16 characters) that must be the ID code of an ingredient in the receiving program, and an ingredient name of up to 32 characters that is ignored. The ingredient name must be enclosed in double quotation marks (“ “) if it contains a comma; otherwise, quotation marks are optional.

The fourth item is a number which is the amount of the ingredient in the formula. The sum of these amounts can be any number.

Following the ingredient lines can be another formula line and ingredient lines. Include as many formulas as you like. The following is an example of two formulas in Short Format.

F, BEEFRATION, “Beef Ration”, 0
I, WHEYDEHYDRATED, “Whey”, 42.9022
I, ALFALFAMEAL20, “Alfalfa meal”, 30.5576
I, COMMONSALTNACL, “Salt”, 13.34
I, CORNDENTYELGRAIN, “Corn dent yellow grain”, 10.4922

I, CALCIUMPHOSDIBAS, “Calcium phosphate”, 2.4519
I, MEATWITHBONEMEAL, “Meat with bone meal”, .2561
F, DAIRYMINERALMIX, “Dairy Mineral Mix 2”, 0
I, OYSTERSHELLSGRND, “Oyster shells”, 31.4228
I, POTASSIUMCHLORID, “Potassium chloride”, 12.853
I, MAGNESIUMOXIDE, “Magnesium oxide”, 9.4549
I, VITAMINASUPPLEME, “Vitamin supplement”, 5.75
I, SODIUMSELENATE, “Sodium selenate”, .0007

Sending and receiving prices

The Send / Receive button in the options window sends ingredient prices to another MIXIT-WIN program and receives ingredient prices that are sent from another MIXIT-WIN program.

The Send / Receive button can also send ingredient prices to any program or person and receive ingredient prices that are sent from any program or person. In this case, the other program or person must use a text file with the long or short format as described in “Price format details”.

ID codes
There are two requirements for receiving ingredient prices by a text file.

1. The ingredients that are involved in the transfer must have ID codes that are found in the receiving MIXIT-WIN program. (See “Ingredients: ID codes and rounding numbers” in Ingredients Help and “Nutrients: Sequence numbers and ID codes” in Nutrients Help.)

2. The prices must be in the same units as the receiving program. (See “Metric units and American units.”)

Sending ingredient prices
To send ingredient prices, click the Send / Receive button in the options window. Select Short Format if you want to send the current prices; select Long Format if you want to send the current prices and also the six sets of alternate prices. (See “Ingredients: Ingredient prices” in Ingredients Help.)

Anyone can send you prices
Anyone who knows your ingredient ID codes can send you ingredient prices by writing a short or long format text file using Notepad or another word processor. A description of the short and long formats is in the topic “Price format details.”

Sending ingredient prices
To send ingredient prices, enter the complete name of the folder (or drive letter) in the Path box, the name of the text file in the Name box, and click the Send button. You are asked “Send Prices?” If you answer “No”, the prices you send will be zeros.

Receiving ingredient prices
To receive ingredient prices, click the Send / Receive button in the options window and select Short or Long Format. Enter the complete name of the folder (or drive letter) in the Path box, the name of the text file in the Name box, and click the Receive button.

Price format details
A text file with the short format looks like the following, where “ID code” is the ingredient ID code, “name” is the ingredient name and “price” is the current ingredient price.

ID code, name, price
. . .
ID code, name, price
ID code, name, price

A text file with the long format looks like the following, where “price1”, “price2”, “price3”, “price4”, “price5” and “price6” are the six alternate prices.

ID code, name, price, price1, price2, price3, price4, price5, price6

. . .
ID code, name, price, price1, price2, price3, price4, price5, price6
ID code, name, price, price1, price2, price3, price4, price5, price6

The following is an example of a price text file in short format.

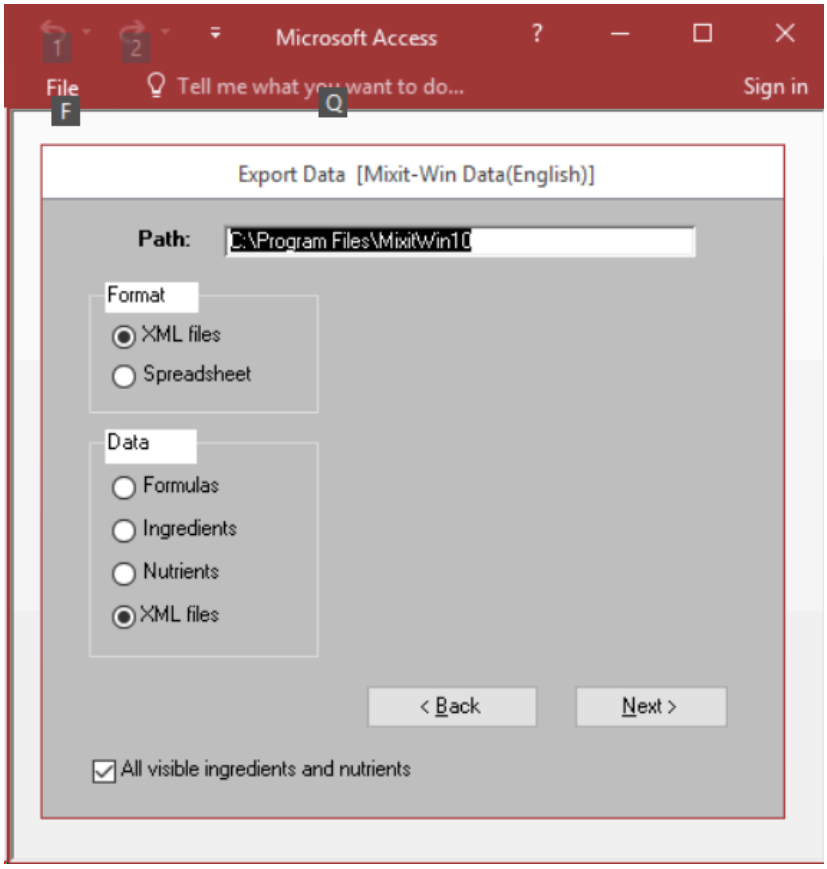
“WHEYDEHYDRATED00”,“Whey, dehydrated”, 4.9022
“ALFALFAMEAL20000”,”Alfalfa Meal”,3.5576
“COMMONSALTNACL00”,”Common salt NaCl”,1.34
“CORNDENTYELGRAIN”,”Corn dent yellow grain”,1.4922
“CALCIUMPHOSDIBAS”,”Calcium Phosphate dibasic”,2.4519
“MEATWITHBONEMEAL”,”Meat with bone meal”,.2561

“OYSTERSHELLSGRND”,”Oyster shells ground”,3.4228
“POTASSIUMCHLORID”,”Potassium chloride”,1.853

“MAGNESIUMOXIDE00”,”Magnesium oxide”,9.4549
“VITAMINASUPPLEME”,”Vitamin supplement”,5.75
“SODIUMSELENATE00”,”Sodium selenate”,5.0007

On receiving ingredient prices from a text file with the short or long format, Mixit-Win verifies that the ID code is a valid ingredient ID code. Mixit-Win ignores the ingredient name.

Exporting Data



You can export MIXIT-WIN formulas (showing ingredient or nutrient amounts) or ingredients (showing nutrient amounts) to comma-delimited text files or to Microsoft Excel or Lotus 1-2-3 spreadsheet files in the following way.

1. From the main menu, click the Options button, and click the Export Data button.

2. In Path box enter the name of the folder where the exported files will be placed.

3. Choose an option in the Format group. If you choose Spreadsheet, you must also choose an option in the Spreadsheet group.

4. In the Data group, choose Formulas to see formulas with ingredients, Ingredients to see ingredients with nutrients, and Nutrients to see formulas with nutrients.

5. Check ‘Use column names’, to put column names in the first row of the export file.

6. For Ingredients and Nutrients, check ‘Sequence’ to put the nutrients in columns and arrange them by sequence number.

7. Click the Next button.

8. Select or deselect formula or ingredient names from the list by clicking with the mouse or using the UP and DOWN keys pressing the SPACEBAR. The Select all button selects all names. When you are through selecting the names, click the Finish button.

File names
Text and spreadsheet files are placed in the selected folder, replacing any files with identical names. The names of the export files all begin with the letters EXPORT followed by the letter F for a formula file, I for an ingredient file, or N for a nutrient file.

Text files have the extension TXT, Microsoft Excel files have the extension XLS, and Lotus files have the extension WK1 or WK3. In addition, Microsoft Excel file names end with 3, 4, 5 or 9 to denote Microsoft Excel version 3.0, version 4.0, and version 5.0 and 7.0, or Excel 97 and 2000. For example, EXPORTF.TXT is a comma-delimited text file containing formulas with their ingredient amounts, and EXPORTI3.XLS is a Microsoft Excel version 3.0 spreadsheet file containing ingredients with their nutrient amounts.

The daily factor table

The daily factor table is an internal table that contains nutrient units, daily units, intake units and conversion factors. MIXIT-WIN uses this table to convert the dry matter intake of an animal to the daily nutrient amounts required or consumed by the animal. You choose an intake unit (g/day, kg/day, lb/day) from the ‘Intake unit’ drop-down box of the options window.

You choose daily units from the ‘Units’ drop-down box of the Nutrients window. The ‘Units’ drop-down box of the Nutrients window lets you select pairs of units: a nutrient unit and a daily unit. For example, you can select the pair % (g/day) in which the nutrient unit is ‘%’ and the daily unit is ‘g/day’, or the pair kcal/lb (kcal/day) in which the nutrient unit is ‘kcal/lb’ and the daily unit is ‘kcal/day’. These pairs of units are stored in the daily factor table. Different nutrients can have different nutrient units and daily units.

The daily factor table has percentages (%), parts per million (ppm and mg/kg), calories (cal, kcal and mcal),international units (IU and KIU), micrograms (mcg), and less-known nutrients such as “million colony forming units” (Mcfu). You can add your own nutrients, which is really the point of this help topic.

Why change the daily factor table?
The daily factor table belongs to MIXIT-WIN (it is not part of the database MixitDat.accdb) and may change if you update MIXIT-WIN. The button to change the daily factor table is hidden in the options window for several reasons.

--It is easy to damage the daily factor table.
--You may not want to use dry matter intake and daily nutrient values.
--The intake and daily units installed with MIXIT-WIN are sufficient for your purposes.

On the other hand, there are reasons you may want to change the daily factor table.

--You need more intake units or daily units.
--You want the intake units and daily units in a different language.

If the intake units and daily units of MIXIT-WIN are sufficient for your purposes, please skip this topic. Otherwise, read the following sections carefully, and don't change the daily factor table unless you are sure you understand what to do.

Introducting the daily factor table

For each intake unit and each pair of units, the daily factor table has a row with a number that converts the intake unit to the daily unit by means of the nutrient unit. For example, one row of the daily factor table is shown below.

kcal/kg kcal/day lb/day 0.45359237

This row is used to convert the dry matter intake (lb/day) of an animal to the daily nutrient amount (kcal/day) required or consumed by the animal when the nutrient unit is kcal/kg. If the nutrient is ME Energy, the ME Energy content of the ration is 500 kcal/kg, and the dry matter intake is 10 lb, then the daily amount required or consumed by the animal is 2268 kcal/day, as shown below.

500 kcal/kg * 0.45359237 kg/lb * 10 lb/day = 2267.9615 kcal/day

Changing the daily factor table

You probably should not change the daily factor table. Read the previous topic "Why change the daily factor table?" before changing the daily factor table. If you decide to change the daily factor table, click the Options button and then click the Prices button (the button with a pencil) with the right mouse button. The daily factor table appears. Enter or change the rows of this table after reading the following sections carefully.

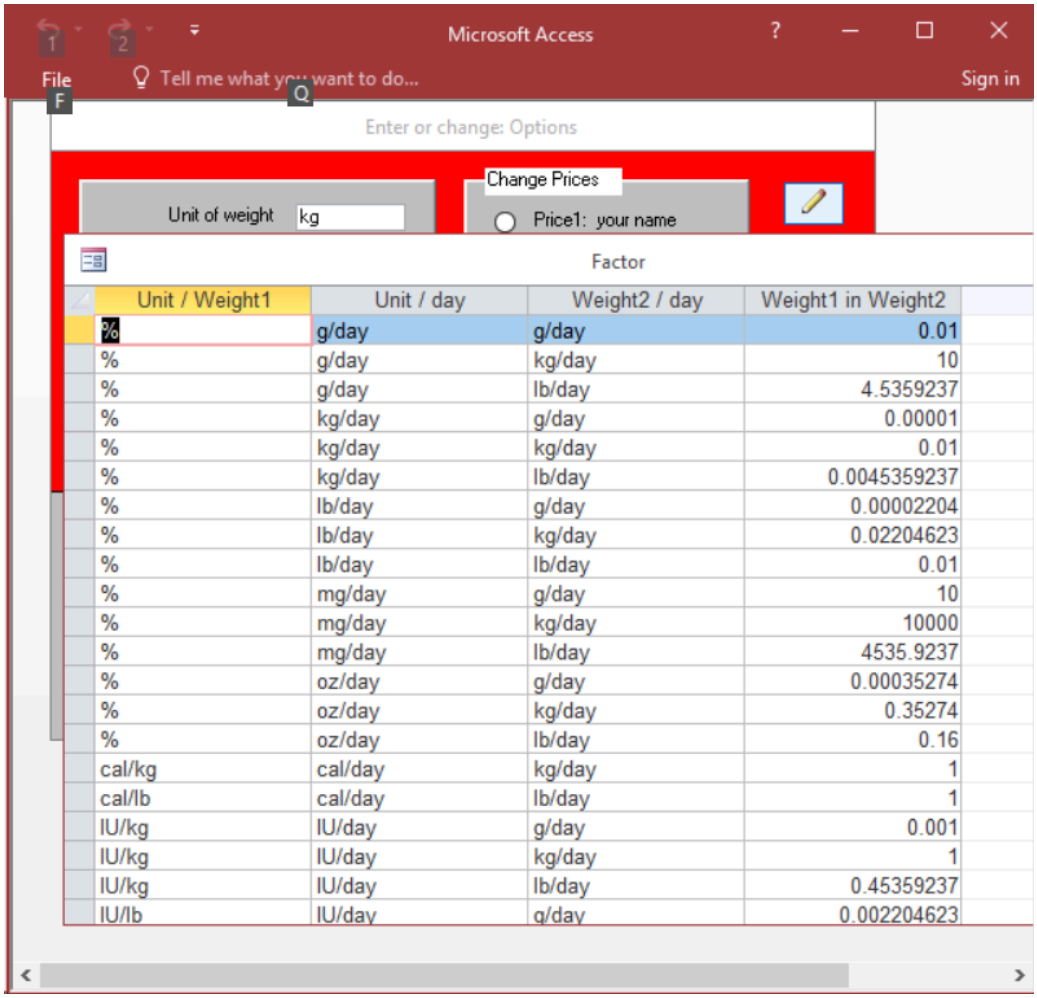
Before changing the daily factor table

Copy the daily factor table to a spreadsheet before you change it (see “Working in Windows: Copying a table” in Exit Help.) You should also copy the daily factor table after you change it, since you may have to restore your changes if you install a new version of MIXIT-WIN. You can also back up and import the daily factor table (see “Backing up and importing data: Backing up data” in Databases Help.)

Problems after changing the daily factor table

After selecting an intake unit in the Options window and clicking the down arrow to the right of the Select box in the Nutrients window, you will only see those items in columns 1 and 2 of the daily factor table (with no repetitions) whose intake unit appears in column 3. If a nutrient unit doesn’t appear in the Select drop down box of the Nutrients window, it probably means that this nutrient doesn’t appear in a row of the daily factor table with your intake unit in column 3. A bigger problem is caused by having the wrong factor in column 4 of the daily factor table. The remaining sections will show how to avoid this.

Columns of the daily factor table



Unit / Weight1	Unit / day	Weight2 / day	Weight1 in Weight2
%	g/day	g/day	0.01
%	g/day	kg/day	10
%	g/day	lb/day	4.5359237
%	kg/day	g/day	0.00001
%	kg/day	kg/day	0.01
%	kg/day	lb/day	0.0045359237
%	lb/day	g/day	0.00002204
%	lb/day	kg/day	0.02204623
%	lb/day	lb/day	0.01
%	mg/day	g/day	10
%	mg/day	kg/day	10000
%	mg/day	lb/day	4535.9237
%	oz/day	g/day	0.00035274
%	oz/day	kg/day	0.35274
%	oz/day	lb/day	0.16
cal/kg	cal/day	kg/day	1
cal/lb	cal/day	lb/day	1
IU/kg	IU/day	g/day	0.001
IU/kg	IU/day	kg/day	1
IU/kg	IU/day	lb/day	0.45359237
IU/lb	IU/day	g/day	0.002204623

When you open the daily factor table (by clicking the Options button and then right-clicking the Prices button, which is the button with a pencil) you will see a large table. This table can be regarded as three (possibly more) tables, one table for each one of the intake units. Mixit-Win comes with three intake units, g/day, kg/day and lb/day, which you select from the 'Intake unit' drop-down box of the options window, but you can create other intake units as shown below in the section "Entering or changing intake units."

The intake units all appear in column 3 of the daily factor table. You may be using a single intake unit, say kg/day. In this case, you should only look at the rows of the daily factor table that have kg/day in column 3, and ignore the other rows. This means that you are looking at about 1/3 of the daily factor table, and these are the rows you will see in the 'Units' drop-down box of the nutrients window. Of course, if you change the intake unit (in the options window) you will see different rows of the daily factor table in the nutrients window.

The daily factor table has four columns:

Column	Description	Example
Unit / Weight1	A nutrient unit that will be selected from the 'Units' drop-down box of the nutrients window. Left half of a pair.	Mcal/kg
Unit / day	A daily unit that will be selected from the 'Units' drop-down box of the nutrients window. Right half of a pair.	Mcal/day
Weight2 / day	An intake unit that will be selected from the 'Intake unit' drop-down box of the options window.	g/day
Weight1 in Weight2	A number that represents how many units of Weight1 are contained in Weight2.	0.001 kg in 1.0 g

The daily amount of a nutrient is the product of the factor (the number in column 4) and the dry matter intake. In the above example,

1 Mcal/kg * 0.001 kg/g * 3000 g/day = 3 Mcal/day

All three units, Mcal/kg and Mcal/day and g/day, must appear in a single row of the daily factor table for MIXIT-WIN to perform this calculation. If these three units do not appear in a single row, the daily amount will be zero.

A simple calculation

If you want to add or change a row of the daily factor table, you should write a check list as follows.

```
    Unit = (a nutrient name of 4 or fewer letters)
 Weight1 = (the nutrient weight unit)
 Weight2 = (the intake weight unit)
       X = (Weight1 in 1 Weight2)
```

X is how many Weight1 are in 1 Weight2. For example,

```
There are X  g in 1 kg.  X = 1000
 There are X kg in 1  g.  X = 0.001
 There are X kg in 1 lb.  X = 0.45359237

 There are X lb in 1 kg.  X = 2.2046229
```

In the previous example,

```
    Unit = Mcal
 Weight1 = kg
 Weight2 = g
    X = 0.001 (there are 0.001 kg in 1 g)
```

The following four values should appear in the four columns of a single row of the daily factor table, in the order shown.

```
    Mcal/kg    Mcal/day   g/day      0.001
```

Enter these four values in the empty row at the bottom of the daily factor table, or use these values to change another row.

Percentage and parts per million

A special case occurs when the nutrient concentration in column 1 is % (per hundred) or ppm (parts per million). In this case, you should write the same check list as shown above, but change the name in column 1 to % (or ppm), change the name in column 2 to Weight1/day, and change the factor in column 4 to X/100 (or X/1000000). In the previous example, the row should be

```
    %          kg/day     g/day      0.00001
```

or

```
    ppm        kg/day     g/day      0.000000001
```

Entering or changing intake units

The names that appear in the first three columns of the daily factor table cannot be longer than 8 characters, and this limitation must be kept in mind when entering a new intake unit or changing an existing intake unit.

One reason you may want to change the name of an intake unit is to change the English word ‘day’ to another language. To make the change, open the daily factor table and change the word ‘day’ everywhere it appears in columns 2 and 3, but be sure to observe the 8 character limit.

MixitWin comes with three intake units, g/day, kg/day and lb/day, which you select from the ‘Intake unit’ drop-down box of the options window, but you can add other intake units. To add an intake unit, say mg/day, you merely put ‘
mg/day’ in column 3 of a new row. For example, you could write the following check list (noting that Weight2 is the intake weight unit).

```
    Unit = Mcal
Weight1 = kg
Weight2 = mg
    X = 0.000000001 (there are 0.000000001 kg in 1 mg)
```

The following four values should appear in the four columns of a single row of the daily factor table, in the order shown.

```
Mcal/kg    Mcal/day   mg/day     0.000000001
```

Enter these four values in the empty row at the bottom of the daily factor table, or use these values to change another row.

When you enter a new intake unit, its name will appear in the ‘Intake unit’ drop-down box of the options window. This is because the drop-down box takes its values from column 3 of the daily factor table. After selecting your new intake unit, say mg/day, you may be surprised to find that you have only one choice in the ‘Units’ drop-down box of the nutrients window. But your choices are limited by the number of rows of the daily factor table that have mg/day in columns 3, and so far you have entered only one such row.

Getting help

MIXIT-WIN features online help that is accessed by means of help buttons and the F1 function key. Help buttons are the narrow buttons in the MIXIT-WIN startup menu and in the MIXIT-WIN main menu. Clicking a help button opens a help file.

For example
Supplier Help is the help file for the Supplier program. You open Supplier Help by clicking the narrow button next to the Supplier button in the MIXIT-WIN startup menu. Options Help is the help file for the Options button in the MIXIT-WIN main menu, and you open Options Help by clicking the small button next to the Options button.

Books and topics
Help files contain books and books contain topics. A book icon is a book and a topic icon is a question mark. Double-click a book icon to see the topics in the book, and double-click a topic icon to get information about the topic.

Help file references
Help files are referenced by book, topic and file name. For example, (See “Edit This Formula: Printing the current ration” in Formulas Help.) refers to the topic “Printing the current ration” in the book “Edit This Formula” of the Formulas help file, which you open by clicking the narrow button next to the Formulas button in the MIXIT-WIN main menu. If you are in the Formulas help file, this is shortened to (See “Edit This Formula: Printing the current ration.”), and if you are in the Edit This Formula book of the Formulas help file, it is simply (See “Printing the current ration.”)

Context-sensitive help
When working in a window of MIXIT-WIN you also get help by pressing the F1 function key. This context-sensitive help provides help with the task you are performing. If the information in this help window is not sufficient, use the “Contents” or “Index” buttons at the top of the help window to see other topics.

Keeping a Help window on top
You can re-size a help window (just drag a border), keep a help window visible while you are working in MIXIT-WIN (in the Options menu of the help window select Keep Help on Top, and click On Top), and add your own comments to a help window (in the Edit menu click Annotate).

Working in Microsoft Windows and Access

Overview

Working in Microsoft Windows and Access
This section discusses various ways to move around in the windows of MIXIT-WIN and select items from lists and tables by using the mouse and the computer keyboard. Most of these methods are common to other Windows programs. Many techniques that you

use in MIXIT-WIN are described here, but not all. For the most part, methods that work in other Windows programs also work in MIXIT-WIN.

Help
Press the F1 function key for help with any MIXIT-WIN program. (Click underlined words for more information.)

Keyboard and mouse

Keyboard and mouse
The following keys on the computer keyboard can be used with MIXIT-WIN. The ENTER, SHIFT, CTRL, TAB, ESC, DELETE, SPACEBAR and F1 keys; the arrow keys (on the keyboard, not on the numeric keypad) UP, DOWN, RIGHT and LEFT; and the PAGE UP and PAGE DOWN keys. In the help files, these key names are capitalized. The plus sign (+) is used when two keys are pressed together. For example SHIFT+TAB means to hold down the SHIFT key and press the TAB key.

The mouse can be configured as right-handed or left-handed. In the help files, it is assumed that the mouse is right-handed, and ‘click’ means to press the left mouse button.

Buttons and tabs

Buttons and tabs
Most windows of MIXIT-WIN have buttons, which are rectangular controls that you click to perform a task or open another window. Some buttons have words, others have pictures. Hold the mouse pointer over a picture button for several seconds to see a description of its purpose.

The most important way to move around in a window is to move the mouse pointer to a button or box, and press the left mouse button. This is what is meant by the phrase ‘click the button’ or ‘click the box’. The same action can often be accomplished on the keyboard by pressing the TAB key (or SHIFT+TAB key) several times to move to the button or box, and then pressing the ENTER key.

Some windows have tabs that look like the tabs on file folders. To open a folder, click the folder tab with the mouse, or press the CTRL+TAB key (or CTRL+SHIFT+TAB key) several times.

Drop-down, find, and list boxes

Drop-down boxes
MIXIT-WIN uses ‘drop-down’ boxes. A drop-down box is a white box that may be blank or show a name. At the right side of a drop-down box is a small control with a downward pointing arrow. When you click this arrow, a list of names drops down, and you can select a name from the list. To select a name from the list:

* Click the name with the left mouse button, or
* Use the arrow keys to highlight the name, and press the ENTER key, or

* Type part of the name in the box, and press the ENTER key.

If there are more names in the list than can be displayed in the window, a ‘scroll bar’ appears. Scroll bars are vertical or horizontal controls that let you see all of the items in a list. Either click the scroll bar arrows or drag the scroll box to scroll through the items in the list.

Find boxes
A ‘find box’ and a ‘find button’ appear below some drop-down boxes to help you find names if you only know part of the name. Enter part of a name in the find box and click the find button (the button with the binoculars.) All names that contain the characters in the find box will appear in the drop-down box when you click the downward pointing arrow. For example, enter “corn” (without the quotes) in the ingredient find box to see all ingredients that contain the word “corn”, such as “Yellow dent corn” and “Acorn kernels”.

List boxes
A ‘list box’ is a control that displays many items in a large box, and you can select several items in the list. A list box has a scroll bar if there are more items than the box can hold. You select multiple items in a list box by holding down the SHIFT key and clicking them with the mouse or by holding down the SHIFT key and pressing an arrow key to extend the selection from the previously selected item to the current item. You can also select items by dragging with the mouse. Holding down the CTRL key and clicking an item selects or deselects that item.

Tables

Tables
A table looks like a spreadsheet, with columns and rows, and can contain text and numerical data. The easiest way to move around in a table is with the mouse and the arrow keys. Tables may have columns ‘locked’ so you do not accidentally change the data.

For example
Clicking the Balance a Formula button in the main menu of MIXIT-WIN shows an ingredient table, a nutrient table, and a ratio table. The columns of these tables with the ingredient and nutrient names are locked, but you can change these names in the Ingredients and Nutrients windows.

Copying a table

Copying a table
You can copy a table to any spreadsheet (such as Microsoft Excel) or word processor (such as Microsoft Word or WordPerfect) that supports copy (CTRL+C) and paste (CTRL+V) operations. Copy the entire table, or select adjacent rows or columns to be copied.

1. Select the individual rows or columns to be copied (see the following topic “Selecting rows and columns”) or click the highest box at the left of the table to select the entire table.

2. Press CTRL+C to copy the data.

3. Without closing MIXIT-WIN, switch to Microsoft Excel or Microsoft Word.

4. In Excel, click in the upper left corner of the worksheet where you want the first column name to appear. The copied records will replace any existing cells in the area.

5. In Word, click in a document where you want the table to appear.

6. Press CTRL+V to paste the data.

7. In Excel, you may need to adjust the row height of data you paste onto your worksheet. Select the rows, click Cells on the Format menu, click the Alignment tab, and then clear the Wrap text check box. Then point to Row of the Format menu, and click AutoFit.

Selecting rows and columns

Selecting rows and columns of a table
The following mouse and keyboard techniques select rows and columns of a table.

To select	Click
A row	the box at the left of the row.
Adjacent rows	the box at the left of the row, and drag to extend the selection.
A column	the box at the top of the table.
Adjacent columns	the box at the top of the table, and drag to extend the selection.

To select	Do this
The current row	Press SHIFT+SPACEBAR.
Adjacent rows	With a row selected, hold down SHIFT and press an arrow key.
The current column	Press CTRL+SPACEBAR.
Adjacent columns	With a column selected, hold down SHIFT and press an arrow key.

Finding help files

You get help with MIXIT-WIN and its related programs in two ways. One way is to press the F1 function key when you are in a window of a MIXIT-WIN program. The other way is to open a Help file.

Help files are opened by clicking the narrow buttons in the MIXIT-WIN startup menu and the MIXIT-WIN main menu. The MIXIT-WIN startup menu is the menu of programs that you see after clicking the MIXIT-WIN icon on the desktop. The MIXIT-WIN main menu is the menu you see after clicking the Mixit-Win button in the MIXIT-WIN startup menu.

Help with MixitWin main menu

The following are the Help buttons in the MIXIT-WIN main menu.

Edit Help
Formulas: current and balanced rations

Balance Help
Formulas: current and balanced rations

Automatic Processing Help
Balancing rations automatically

Parametrics Help
Changing balanced rations by small increments

Feed Labels Help

Making, saving and printing feed tags

Inventory Help
Maintaining ingredient and formula inventories

Prices Help
Printing price sheets and invoices

Clients Help
Keeping ingredient prices for may clients

Exit Help
A MIXIT-WIN tutorial

Ingredients Help
Adding and changing ingredients

Nutrients Help
Adding and naming nutrients

Formulas Help
Formulas: current and balanced rations

Options Help
Changing weight units and prices

By Ingredient Help
Changing nutrient amounts of ingredients

By Nutrient Help
Changing nutrient amounts of ingredients

Help with MixitWin startup menu

The following are the Help buttons in the MIXIT-WIN startup menu.

Mixit-Win Help
Introduction to the MIXIT-WIN program
Using the Spanish version
Updating MIXIT-WIN
Locating MIXIT-WIN files
Getting help

Databases Help
Selecting, copying or deleting a database
Making an empty database
Translating into another language
Backing up and importing data
Installing animal data and importing data from Excel
Importing and converting MIXIT-2 and MIXIT-2+ data

Supplier Help
Introduction to the Supplier program
Adding or changing products and purchase orders
Printing reports and backing up data
Updating ingredients from MIXIT-WIN
Updating the MIXIT-WIN inventory

Backup Help
Automatically backing up databases
Selecting backup options
Restoring databases

Exit Help
Dietary cation anion balance
Stochastic feed formulation
Computer feed formulation

EggPro Help
Introduction to the EggPro program and database

Formula templates and weekly formulas
Breeds, houses and amounts per bird per day
Backing up, importing and moving data

BeefPro Help
Introduction to the BeefPro program
Pens and feeding schedules
Profit projections and reports

MultiMixit Help
Introduction to the MultiMixit program
Preparing formulas for MultiMixit
Selecting ingredient and formula amounts
Balancing formulas and printing reports

IntrFace Help
The InterFace database

Company, history and supplier tables
Formula, invoice, price and run tables
Details for programmers: export and import text files
Repete, WEM and comma delimited text files

Invoices Help
Introduction to the Invoice program
Price sheets, formulas and customer names
Making and printing an invoice

Using the Spanish version

Using the Spanish version
The words and phrases that appear in the windows and reports of MIXIT-WIN are in English. To change these words to Spanish, click the Databases button in the startup menu of MIXIT-WIN. Click OK and select the option 'Español'. The next time you start MIXIT-WIN the words and phrases will be in Spanish.

To select the Spanish database of ingredients, nutrients and formulas, click the Databases button in the startup menu of MIXIT-WIN. Click OK, click the Select a Database button and another window opens. On the left side of this window is a list of databases. Click "Mixit-Win (Español)" and click the Select a Database button. Enter your company name and address. The next time you start MIXIT-WIN the ingredient, nutrient and formula names will be in Spanish.

Other languages
The Spanish words and phrases that appear in the windows and reports of MIXIT-WIN can be edited, and even changed to words and phrases in another language. For information about changing the Spanish words and phrases, click the small button next to the Databases button and choose the topic "Selecting a language."

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