

AMTS.Cattle Quick Start Guide

AMTS.Cattle version 2.0

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Introduction

AMTS.Cattle is an implementation of the CNCPS ver. 6.1 for every day use by nutritionists. It was designed to work with multiple groups of cattle within the same file. It can be used either as a stand-alone product, or in conjunction with AMTS.Cattle.Pro™ within a company setting.

Instead of multiple feed libraries and always starting from scratch with location and group information, AMTS.Cattle utilizes a template file. This template file is created by AMTS.Cattle.Pro™. As a stand-alone product, the AMTS.Cattle template file contains common AMTS Feeds and a selection of different cattle groups and locations to choose from. Additional feeds can be imported from the main AMTS™ Feed Library. NOTICE: for an additional fee, AMTS™ can set up a custom template file for an individual user (contact AMTS™ for more information including charges). Individuals are encouraged to work with AMTS.Cattle™.Pro as AMTS.Cattle™ works most efficiently within a company setting with multiple nutritionists and a technical team.

Within a company, the technical team can create different templates (by mill, geographical region, dairy or beef, etc.) utilizing local data and pricing for feeds (on- and off-farm feeds). These templates can be time stamped so that users can update recipe and composite pricing when a new template is loaded. Additionally, these template files can contain additional information making them useable only by authorized users. This additional information includes: logos, screen settings (what is shown for results and order of results), company contact information, and others.

AMTS.Cattle uses the same file structure as AMTS.Cattle.Pro™. Thus, a AMTS.Cattle user can send a file to a AMTS.Cattle.Pro™ user (e.g. field person sends a file to the technical nutritionist for review) and the AMTS.Cattle.Pro™ user can open the .Cattle file in .Cattle.Pro.

AMTS.Cattle also introduces a new non-linear optimizer. This optimizer is a genetic algorithm we have licensed. AMTS.Cattle is the first program within animal nutrition to introduce this advanced optimization methodology. In addition to formulating for least cost, the user can select to maximize income over feed costs. This simple change in the objective function can (and does) return different results and we are very excited by offering this.

Install

Two setup files must be used to utilize the full functionality of AMTS.Cattle.

If just installing the Demo version of the software, the first file is the AMTS Advanced Optimizer Setup Demo.exe. If you have purchased the software, the installation file for the optimizer is: AMTS™ new optimizer setup release.exe. (Note: if you have installed the demo version and then purchased AMTS™.Cattle™, you will need to install the release version of the optimizer.)

Double click on this file to begin the installation process. When prompted for user name and company, you must input this information. This Demo version will run for 30 days from its first use.

NOTE: if you have installed either the Optimizer Demo or the Optimizer Release from AMTS previously, you do not need to install this file. If you have the Optimizer Demo in-

stalled and it has been more than 30 days (ie the demo is expired) please contact AMTS support (support@agmodelsystems.com) for information regarding reactivating the demo.

For release version installation, you will be prompted for a company name, user name, and a serial number. Input this information and the serial number provided by AMTS™.

Following installation of the optimizer, double click on the AMTS.Cattle v1.msi file. Follow the prompts throughout installation.

Ideally, prior to installation, email support@agmodelsystems.com with the Company Name you are with. We will email you an encrypted key that you will input (copy and paste is best way to do this) into the Company Name field that will be requested when you run the program. If you are not with a company (or are just evaluating the program), this company name is optional. The company name is used as part of security when opening settings files. A protected settings file can only be opened if the company names match between the .Cattle™ setting and the settings file.

Running the Program

When you start the program, click on “Continue without Activation”. Notice that you have 30 days to use the program prior to activation. If after 30 days, you wish to purchase .Cattle™ (or you fail to register .Cattle™ within 30 days), contact AMTS™ and we can get you up and running again.

You will then be prompted to select a settings file to load. A settings file must be available to work with .Cattle™! Select the Default Settings file and click on Open.

As with any AMTS product, there is no reason to worry about saving a file. Once an input is made, it is written to the file thus, automatically saving the file. When you open a file, as with other AMTS™ products, a copy of the farm file you are opening is placed in the Farms Backup/*farm name* folder. The file you end up working with is renamed automatically with the time and date stamp when opened as part of the name. You can always go back and open an old file just by browsing to the Farms Backup folder.

What does the settings file contain?

The settings file is created with AMTS.Cattle.Pro™. It contains different locations, group information, feeds, and recipes. The .Cattle.Pro user basically creates a farm file that contains as much information as deemed necessary for the .Cattle user to fully utilize the power of the model. These settings are then available in .Cattle to use as defaults. For example, a cow barn (location), 90 pound lactating cow (animal group), fed a recipe that is corn silage/alfalfa hay based. All of these values can be modified by the .Cattle user within the Group File with ease. The settings are meant to serve as a good starting point to save the .Cattle user time.

After opening the Settings file, go to: View, Settings.

Here you can set your User ID and Company ID. Company ID can only be inputted using the encrypted key provided by AMTS™. The User ID would be something like your last name, full name, or initials. It can only be alphanumeric with underscores allowed.

Under User Information, fill in as much of the data as you wish. These fields can be used in headers/footers for reports.

Also on this screen, you can change how many decimal points to show for different feed types, if you wish to view DM, As Fed, or Both on the recipe screen, English or Metric units, Energy Units, the currency symbol (you can just type directly in this cell), and if you wish to work with Shrunken Body Weight (assumed 12 hours without access to feed and water) or Full Body Weight (FBW). Make your selections. You can change these at any time.

On the Reports & Appearance tab, there are several things you can change. These are rather self-explanatory. For Headers and Footers, you can either type what you want directly, or use the field names from the User Information from the Program Settings tab.

Some of these settings can only be changed if you are an individual user. Others are set automatically via the settings file from your company.

Once settings are set, close the setting screen and click on Create New Farm

Input a Farm Name. This is the only time you will need to worry about naming/saving a file. File names must be alphanumeric and can use the underscore. After inputting a name, click on OK.

Once you click on OK, the Farm Inputs screen appears. If you opened a file, this same screen appears after opening the farm.

As you can see, the Farm Inputs screen has three main areas. The area on the left is for client information (farm name, contact info, etc.). The bottom is an area for you to make notes about what you did. The area on the right (Under the word Groups) is currently blank. This is where a list of all groups within the farm file is located. So, let's add a new group.

Click on Add New Group.

A dialog box will appear asking you to Name the Group. Once the group is created, the Location and Group Defaults screen opens.

The top of this screen lists the different Location Defaults to select from. Click on the name of the location you want to use (the name is a button). Don't worry about changing values yet. When you click on a location name, the column background color will turn to a beige color.

The bottom of the screen contains the different Group Defaults. As with locations, just click on the group name you want to use.

Once these are selected, simply click on the X in the upper right corner of the Location & Group Default window. WARNING: make sure you click on the correct X. The X in the far upper right corner of the screen will CLOSE the PROGRAM.

After clicking on the X, you will be returned to the Farm Inputs screen. You should now see your new group listed under the Groups section of this screen. The second column allows you to input how many animals are in the group. This is used for multi-group reports as well as the Batch Feed sheets reports. Also notice on the toolbar, (where it says Create New Farm, Open Farm, Farm, Feeds) that a new button has appeared with the name of the group you created. As you create more groups, a button will be created for each one. This is simply to make it faster to move around the program.

The next step is to add feeds to the farm file. There are two ways to do this. The first is very quick. If the settings file contains default recipes, you can select a recipe and it will load all the feeds in that recipe to the farm file. To do this, click on the Inputs button next to the group you created. On the lower right corner you will see three buttons: View Group Defaults (the screen you selected the location and group from), View Recipe Defaults, and Create Batch Report. Click on the View Recipe Defaults. A screen will appear listing the recipes loaded in the settings file. The View button next to each recipe, when clicked, expands to show what ingredients and their percentages are in that recipe. Clicking on Select will load that recipe. Upon loading, .Cattle adds all the feeds for that recipe automatically to the group file. Thus, as long as the template file contains default recipes, the .Cattle user can quickly and easily load all the feeds required for formulation using this method.

The second method for adding feeds to a recipe is by using the Feeds Screen which is accessible by clicking on the word Feeds on the tool bar. This screen is also used for updating pricing, re-naming feeds, edit chemical composition, add/remove feeds to the user feed library, and allows the user to reorder feeds. You will notice that there are three distinct areas on the Feeds Screen. The upper left lists all the feeds that are available in the template file. *It is critical to remember that these feeds are 'templates' and once transferred to the group file, should be edited with farm specific data to ensure accurate predictions.* To view the base composition of any feed, simply click on it and a dialog box appears with its composition. The lower left area lists feeds that the user has added to their User Feed Library. Once a feed is added to the UFL, it can be used in any group file. Both the Template File Feeds and the UFL can contain an unlimited number of ingredients AND composites. The right side of the Feeds Screen shows the feeds that are loaded in the farm file. If it is blank, no feeds have been transferred (copied) to the Farm File. Transferring feeds is very simple. To the right of each feed you will see an arrow. Simply click on the arrow for each feed you wish to transfer (or click on Transfer All to copy all feeds). Upon clicking on the arrow, a COPY of the feed is made to the Group Feeds section of the screen. The Template File Feeds are READ ONLY and can only be edited within .Cattle.Pro.

Working with Farm Feeds

Once you have transferred feeds (either from the Recipe Defaults method or directly from the Feeds Screen), you have several options now.

- To view the base composition of a Farm Feed, click on the Info button to the right of its name.
- To Delete a feed from the Farm, simply click on the X button
- To place a feed in the UFL, simply click on the UFL button
- To change a feed name, click on the Farm Feed name you wish to change and type in a new name. Names can only be alphanumeric and can contain the underscore character.
 - Hint: if you are renaming multiple feeds, use the up and down arrows to move around.
- To change feed pricing, do the same as if renaming feeds.
- If you find that you need a feed that is not in the template file or the UFL, you can import it from the main AMTS™ Feed Library. The button at the top right (Import AMTS™ Feeds) brings a new screen up showing the feeds in this library. You can select multiple feeds to import. To select feeds in this screen, click in the checkbox next to the feed name.
- To reorder the feed list, click and hold the mouse button on the row number of the feed you wish to move. Now simply move your mouse up or down. As you move your mouse, you will see the rows of the feed you selected change color and show the position where you want it. Just drag the feed where you want and let go of the mouse button (drop the feed).
 - You can also use the little diamond at the top of each column to sort. Simply click on it (e.g. if you clicked on the diamond in the feed name column, it will sort alphabetically. Click on it again and will be in reverse order (Z-A)).
 - NOTE: this order change sets the default for the recipe screen. You can also reorder feeds on the recipe screen. Once the recipe is created though, reordering feeds here on the feed screen does NOT reorder them on the recipe screen.
- To edit the composition of feed, click on the Edit button. A new screen appears. On this screen, you will see the Current Feed Values and a column labeled New Version. Input

your updated values from the lab in the New Version Column. The last column, labeled Difference, shows what percent change there was in the composition values. If a value changes more than 10%, the percentage appears in RED. When done editing, click on OK to close this screen.

- You can also import feed analysis electronically using the AMTS XML format implemented at several labs. Simply click on File, Import Feed Analysis, find the file you received from the lab (typically with an .amts_fa extension), select the feed from the lab file, and match with a feed from the farm file. NOTE: the feed must exist in the farm file to import analysis.
- If there is a composite in the farm file, you will notice that the Edit button on the feeds screen is now a \$ and the price is in grey. By default, a composite price is calculated as the weighted average of the prices of its component ingredients. If you click on the \$, a warning message appears saying that you are breaking the link. Clicking OK turns the grey color to black and you can now input a price. This allows you to manually input a price for a composite to include margin, discounts, trucking, etc. If you click on the \$ again, you get a new message saying that the composite price will revert to a calculated value making the price cell grey again.

The Recipe Screen

This screen is where the .Cattle user will spend most of their time! It is very flexible and taking a little bit of time to go through it now will pay large dividends in the future.

On the right side of the screen are the feeds available for the recipe for this group. If, in View Settings, you selected to show both DM and As Fed amounts, there will be three columns. You can input amounts in either DM or As Fed on the fly. The simplest way to input amounts is to use the arrow keys to move around. After leaving each cell, the outputs (right side of the screen) are updated. You can also change the total amount of a recipe fed just by double clicking on either the DM or As Fed total and inputting a new value. If you triple click (yes, triple click) on any numeric cell, a calculator appears. This handy tool allows you to change amounts in percentages. For example, if the total diet was 50 lbs DM and you wanted to increase it 5%, triple click on the 50 and either use your mouse or type in * 1.05 and click on the = sign, OK. This will input the calculated amount into the total DM cell. Either strike Enter or click off the total cell and the outputs will be updated. All feed amounts will have been increased 5% based upon their dry matter percentage of the recipe.

NOTE: all data is stored as a percentage dry matter coupled with a total kilograms dry matter fed to the group. Thus, if working in As Fed, pounds, when you return to the file, it is possible that 20 lbs is returned as 19.99 or 20.01. This is due to all the data interconversions behind the scenes and should not be alarming.

If you RIGHT click on an empty row in the Recipe Feeds side of the Recipe screen, a menu appears. You will see an option to Reorder Recipe Feeds. Clicking on this brings up a screen with a list of the recipe feeds and column for their new order. Simply click on the feeds in the order you want them to appear on the recipe screen (and in reports). You do not need to click on every feed. Click on the feeds through the ones you want to reorder and leave any remaining alone. When you click on the Set Feeds Order button, the feeds are reordered and feeds you did not click on are in the same order as they were.

The right side of the Recipe Screen contains a list of outputs. Those of you used to working with CPM Dairy, CNCPS ver. 6.1 (and earlier) as well as AMTS.Cattle.Pro™ ver. 1.x will notice that this output style is very different! By default, you will see five (5) columns: the output label, Min value, Value (returned value), Max value, and In Opt. There are two more columns that are hid-

den by default: Safe Min. and Safe Max. If you RIGHT-click on an output label, a little box appears that gives three options: Show All Outputs, Show Safe Min/Max Values, and Set Current Outputs as Default. For now, click on Show All Outputs and then right click again and click on Show Safe Min/Max Values. Three new columns appear: Safe Min, Safe Max, and Show.

You have some decisions to make here. Which outputs you wish to see (simply click on the check box in the show column to show or hide an output), what values you would consider to be Safe Min, Min, Max, and Safe Max (our defaults are a good starting point), and what order you want the outputs to be. You can change the order via Drag and Drop as on the feeds screen. Simply click and hold the mouse button on the output you want to move and drag it to where you want it. When you are finished deciding what order and what to show, you can right click on a label and click on Show All Output again. It hides the items not selected to be shown.

NOTE: Unless you right click on a label and tell the program to Set Current Outputs as Default, the recipe screen reverts to its original layout for EVERY GROUP. Additionally, for optimization, it is a good idea to have the Safe Min and Safe Max columns shown.

SPECIAL FEATURE: when formulating or evaluating a diet, you will notice that the Value column will show different colors. If the returned value is within the Min and Max range, it appears in GREEN. If within Safe Min and Safe Max, it appears in a BROWN. And, if outside Safe Min or Safe Max, it is in RED.

REPORT: if you right click on right side of the recipe screen (but not on a feed), a menu appears. The last item is View Simple Recipe Report. This report shows the same outputs and order as you set on the recipe screen! It does not show the Safe Min and Safe Max column but does have a column named Status to replace the colors.

To create a composite (a mix) in .Cattle, you must do so from the Recipe Screen. Right click on a blank row on the Feeds side of the recipe screen and click on Create Composite From Recipe. A new screen appears with all the feeds in the recipe. By default, feeds with an amount greater than zero are automatically selected. Deselect the feeds you do NOT want in the composite and then click on Create Composite. You will be prompted for a name. Type one in and click on OK. On the recipe screen you will now see the composite. Any composite can be easily recognized on the recipe screen as it has a plus (+) sign to the left of its name. If you click on the plus sign, the composite expands to show the feeds and their amounts in the composite. You can change amounts of each feed within the composite here.

NOTE: a recipe can contain multiple composites

SPECIAL FEATURE: to add or remove a feed to composite, click on the plus sign. Now RIGHT click on any feed within the composite. A new menu appears with options to Add a feed to the composite (just slide your mouse to the right to see a list of available feeds. When you click on a feed to add it to the composite, it is added with zero amount fed. Just type in the amount you want for this new composite ingredient). The other option is to remove the feed you Right clicked on from the composite.

Optimization

Optimization is a three step process within .Cattle.

Step 1. Setting Nutrient Constraints

On the recipe screen, you select which nutrients will be used as constraints by clicking the checkbox under the In Opt. column. There are several outputs that cannot be selected. The checkbox is a light grey for these outputs.

Additionally, if you wish to change Safe Min/Max and Min/Max constraints for the selected nutrient constraints, you do this on the recipe screen as well.

Step 2. Setting Feed Constraints

To bring up the Feeds Constraints Window, Right click on an empty row on the Feeds side of the recipe screen. Select Optimize this Recipe. A new screen appears. The first column contains checkboxes. A feed that is checked is included in the optimizer. The feed name and current amounts fed (DM and As Fed) are shown. The Cost column by default brings costs from the Feeds Screen. These costs can be changed here though to do price sensitivity runs (costs inputted here do NOT overwrite costs on the feeds screen!). The last four columns contain Min/Max amounts for each feed in both dry matter and as fed. Min/Max amounts can be inputted in either DM or As Fed! Once you set your feed constraints, click on Continue.

Step 3. The Optimization Screen

As with any diet we formulate, there are different diets that may meet the same constraints and sometimes at the same price. This is the result of non-linear systems of which the biological model within Cattle is. For more information regarding the optimizer used by AMTS LLC, please see our web site (<http://cattle.agmodelsystems.com>).

This optimizer offers a few options. First, do you wish to optimize for least cost, or maximize income over feed costs. This is a decision that must be made based upon the goals and objectives of the client farm. The second option is how many solutions do you want to see returned. An optimizer is by no means a replacement for a good nutritionist. All an optimizer can tell us is what combination of feeds meet the constraints we set. It can not tell us if one solution is better than another for other reasons (such as 'those two ingredients don't mix well together'). Thus, we leave the final decision to you, the nutritionist. You can select anywhere from 1 to 1,000 potential solutions to select from. The final number depends upon how much time you want to wait. Five is a good number to start with! The next option is what search type: Fast, Normal, Exhaustive. These partially relate to time but we have found that the first time you optimize a diet, it may take some time (a minute or two) regardless of the Search Type selected. These set internal optimizer settings and relate to optimizer behavior. More information about these settings can be found on the web site (<http://cattle.agmodelsystems.com>). Typically, Fast or Normal search type will be selected. Finally, you can have results returned in either dry matter or as fed.

NOTE: Unfortunately, non-linear optimization does NOT allow the creation of shadow prices. The only way to generate anything resembling shadow prices is to run multiple optimizations where ingredient prices vary. But remember, shadow prices assume all other things remain constant. They represent only one point in time.

Once your choices have been made, click on the Start Optimization button.

NOTES: If the optimizer does not start returning solutions by trail 1,000, either a nutrient or feed constraint is too tight. Click on Stop Optimization, close the screen, and review your nutrient constraints. To start with, it may be helpful to open up the Safe Min and Safe Max constraints.

When the optimizer finishes, it automatically highlights either the lowest cost or the highest income over feed cost solution depending upon the objective function you selected. If

results are in BLUE, the solution is within Safe Min/Max and a box appears telling you what constraints it failed to meet. A result in BLACK met all desired nutrient constraints.

NOTE: Blue (safe) results are not bad diets. They may just be outside of your desired constraints and sometimes are more economical to use. This is where nutritional judgement is very important. If a diet is more economical and a constraint such as magnesium is 0.34% vs. a desired 0.35%, is it a 'bad' result?

Review the returned solutions and if there is one that you accept, click on the Solution #x (at the top of the grid you will see that the Solution #x is a button). The desired solution must appear with a yellow background! Now click on Accept Solution. You are returned to the Recipe screen where the optimized solution is now the active recipe. Evaluate the recipe fully and if satisfied, you are done. If not, you can re-optimize.

NOTE: unless you change nutrient constraints at this time, the optimizer will run much faster now as it has an "optimized recipe" to begin with.

Reports

.Cattle contains reports in addition to the Simple Recipe Report previously mentioned. These include:

- more comprehensive reports (more complex too)
- Batch Sheets (on-farm feed sheets)
- Composite breakdown to send to mill.

With any report, you have the option of either printing or saving the report as a file (pdf, excel, html).

If you have any questions about using AMTS.Cattle.Pro™.Cattle, please contact us at: support@agmodelsystems.com or call us at +1.607.423.3327.

THANK-YOU from the AMTS LLC team.