



Using the DART RATION Computer Program To Answer Nutrition Questions About Dairy Cattle

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DART RATION is a program designed to help you answer nutrition questions asked by your dairy farmers. Besides balancing rations for least cost, this program allows you to look at the nutritional adequacy of diets fed to lactating cows, dry cows, and heifers. Please do not confuse this program with DART which allows you to access milk production and management information for herds on DHIA in your counties.

This program is protected by copyright laws. The Cooperative Extension Service in Kentucky has purchased the rights to have this program in local county offices. This program is NOT to be distributed to farmers, veterinarians, or local feed mills. If a producer or industry representative would like a copy of this program, they can purchase it from Kentucky Dairy Records Inc. or Donna Amaral-Phillips. All copies of this program contain serial numbers which allow copies of the program to be traced.

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Instructions for Installing Dart Ration

Step 1: Installation to the Hard Drive:

1. Insert diskette into your floppy disk drive.
2. When using the University of Kentucky "CAINSTALL" version, type "CAINSTALL" and follow directions on the screen. This command will only install the DRATION icon under the local section in the Agshell menu.
3. To install the program, type "install" from the floppy drive disk prompt and answer the questions asked. This command will unzip the program and install the program either on the hard drive or to another floppy. This program will be saved in the subdirectory named "DRATION," unless you have changed the directory to install the program. If you have any problems, contact the University of Kentucky Ag Data Center or Donna M. Amaral-Phillips.
4. PLEASE DESTROY COPIES OF OLDER VERSIONS OF DART RATION. (This includes versions 3.0 or earlier.)

Step 2: After the program is installed:

Before you run this program for the first time, please complete steps #1 through 6 listed below:

1. To get into the program:
 - a) If you are using AGSHELL, DART RATION can be retrieved by highlighting LOCAL SECTION on the first screen and DRATION on the second screen.
 - b) If you stored the program on your hard drive and are not using AGSHELL, change to the subdirectory DRATION (cd DRATION). Type RATION <ENTER> to initiate the program.
2. You now should be in the DART RATION program. The screen should have the program's name and version number (5.0). Press <ENTER> to get to the screen that displays the main menu.
3. At the main menu, enter a "7" to go to the special maintenance functions submenu.
4. At the special maintenance functions submenu, enter "3" to create or change set-up parameters.
5. The set-up parameters should appear on the screen. Make the following changes:
 - a) Check to see that the work disk drive (on line #4) is the drive where you want to store your work files. If you want to save your work files to the hard drive, the work drive should be "C." If you want to save the work files to a floppy, enter the work drive (A or B) for the respective floppy disk. By storing herd and feed data to a floppy disk while retaining the program on the hard drive, you can easily move back and forth between two computers without copying files or reentering the data.
 - b) Type in your name and address on the lines for Preparer's name and address.

c) Enter the prices of the minerals listed. Prices are based on price/ton. These minerals include:

Dicalcium phosphate (Dical)

Limestone

Magnesium oxide

Trace mineralized salt

DBL Sulf of K & Mg (Dyna-mate)

Feed grade Monofos (Monoammonium Phosphate)

Potassium chloride

d) Press the F1 key and change the title that appears on the reports to UNIVERSITY OF KENTUCKY-XXXX COUNTY.

e) Press the F10 key to save changes. If you do not exit with the F10 key, your changes will be lost.

6. You are ready to run the program itself.

Using the Dart Ration Computer Program

Step 1: Collect Information Needed To Run the Dart Ration Program

(Page 14 contains an information sheet to help you record the information needed to run this program.)

Part A: Information about the Herd

For Milking Cows and Dry Cows, you will need:

- 1) Number of cows fed in the group
- 2) Average body weight of cows
- 3) Actual average milk production, butterfat test, and price paid for 100 lb milk sold
- 4) Average number of days in milk (For dry cows, days in milk will automatically become 0.)

For Heifers, you will need:

- 1) Number of heifers fed in group
- 2) Breed: Holsteins — large breed
Jerseys — small breed
- 3) Average weight of heifers in group
- 4) Expected rate of gain (lb/day)
 - Computer will accept between 1.0 to 2.0 lb/day
 - For large breeds (e.g., Holsteins) — recommended that heifers gain 1.5-1.7 lb/day
 - For small breeds (e.g., Jerseys) — recommended that heifers gain 1.2-1.4 lb/day

Hints regarding entering information about Milking Herd

- 1) Average Body Weights of Cows:

| | First-calf heifers | Mature cows | Herd |
|-------------|---------------------------|--------------------|--------------|
| Holstein | 1000-1200 lb | 1200-1400 lb | 1150-1350 lb |
| Brown Swiss | 1000-1200 lb | 1200-1400 lb | 1150-1300 lb |
| Jersey | 700-850 lb | 900-1000 lb | 850-1000 lb |

- 2) Average Daily Milk Production

When working with the average cow in a farmer's herd, use the ACTUAL average milk production for the group of cows. A lead factor is used to adjust the milk production upward to challenge feed the group of cows and to account for the normal distribution of milk production seen in a group of cows. This allows the program to estimate how much dry matter these cows will consume based on the actual production. The lead factor increases the amount of nutrients needed for the higher milk production by increasing the nutrient density of the diet.

- 3) Average Number of Days in Milk

This program estimates how much dry matter the average cow will consume. Dry matter intakes are estimated for the average cow in the group using body weight, milk production, the number of days in milk, and the month this diet will be fed.

- a) If the herd is on DHIA, this number can be found on the second (back) page of the herd summary (DHI-202) in the block labeled "Yearly Production and Mastitis Summary."
- b) If the herd is not on test, use the following rules of thumb:
 - If a high percentage of a farmer's cows have calved within the last 3 to 4 months, use 120 days in milk.
 - If you have no idea when cows have calved, use 180 days in milk. (At 180 days in milk, maximum dry matter intake is reached.)

4) Lead Factors

Lead factors are used to increase the nutrient density of the ration to challenge feed cows. The lead factor should be between 1.0 and 1.3. The lead factor used depends on the feeding system, management skills of the farmer, and the amount of milk production for this group of cows.

- a) If the farmer adjusts the grain feeding schedule for each cow (through a computer feeder or in the parlor), use a lead factor of 1.00 or 1.05. This ration will be balanced for nutrients needed for maintenance, milk production, and weight gain at this amount of milk production.
- b) If all cows are fed the same amount of grain, use a lead factor between 1.10 to 1.30. The average amount of milk production for the cows and management skills of the farmer determine the lead factor to use.
 - If production is 45 lb or less, use a lead factor between 1.20 and 1.30.
 - If production is between 45 and 60 lb/cow per day, use a lead factor between 1.20 and 1.30.
 - If production is greater than 60 lb/cow, use a lead factor between 1.10 and 1.20.
- c) If cows are grouped and fed a total mixed ration. Table 1 lists the suggested lead factors for different production groups. To minimize decreases in milk production when cows are switched to a lower production group, milk production between groups should not differ by more than 15%.

Table 1.* Lead Factors for Total Mixed Ration Formulation

| % of cows in each group | -----Production group----- | | |
|-------------------------|----------------------------|--------|------|
| | High | Medium | Low |
| 100:00:00 | 1.32 | -- | -- |
| 70:00:30 | 1.22 | -- | 1.21 |
| 50:00:50 | 1.17 | -- | 1.23 |
| 30:00:70 | 1.14 | -- | 1.25 |
| 33:33:33 | 1.14 | 1.10 | 1.21 |
| 25:25:50 | 1.13 | 1.07 | 1.23 |
| 25:50:25 | 1.13 | 1.14 | 1.21 |
| 50:25:25 | 1.18 | 1.08 | 1.21 |

*Charles C. Stallings, Hoard's Dairyman, February 10, 1985

Part B: Information Needed on Feedstuffs

- 1) Collect information on forages available. You will need:
 - a) Current forage analyses
 - b) Current feed intakes for each group of cows or heifers
 - c) Amount of each forage the farmer has on hand
 - d) Price of each forage if purchased or "home-grown"
- 2) Collect information about concentrates, minerals, and vitamins.
 - a) How is grain fed?
 - 1) Total mixed ration — cows fed in one or more groups?
 - 2) Grain fed in the parlor? Is grain fed according to milk production or do cows eat free-choice for the time in the parlor?
 - 3) Is all or a portion of the grain topdressed on silage?
 - 4) Are cows fed grain through a computer feeder? Is the computer feeder a single or dual system?
 - 5) Combinations of the above?
 - b) List of available grains and their prices
 - c) Information on minerals and vitamins currently fed (need feed tags for nutrient analysis)

Helpful Hints When Entering Feedstuffs

- 1) Distiller's Grains — Limit intake to 20% of the grain mix.
- 2) Corn — Try to get farmer to run a chemical analysis (crude protein) on ear corn or shelled corn if grown locally. Some varieties of corn grown locally may be lower in crude protein than assumed with book values. The crude protein values for shell corn (8.5% crude protein) and ear corn (8% crude protein) have been adjusted downward to account for these changes.
- 3) Corn Silage — Limit the daily intake of silages to the amount the farmer wants to feed each cow.

If no inventories are available, use a maximum of 55-60 lb of corn silage (enter in the block for maximum amount to feed located in the first row of the feed set). Intake of forages should be measured and these intakes used as a starting point when balancing rations for the maximum amount of each feedstuff to feed.

- 4) Soybeans, whole cottonseed, or other high-fat feeds — Are high-fat feeds being included in the diet? If so:
 - a) Limit the amount fed of high-fat feeds. (If high-fat feedstuffs are combined, intakes of each feedstuff will have to be adjusted. Amounts listed are for Holsteins.)

| | | |
|----------------------|----------------|-----------------------|
| Whole cottonseeds | — 6 lb/cow/day | |
| Raw Soybeans | — 4 lb/cow/day | DO NOT FEED WITH UREA |
| Roasted Soybeans | — 4 lb/cow/day | |
| Animal fat or tallow | — 1 lb/cow/day | |
 - b) If these feeds are included, the amount of calcium and magnesium in the total diet should be increased. Fats may tie up these minerals in the intestinal tract and, therefore, decrease the amount available to the cow.

Where to make changes: Under the main menu, press #1 to retrieve the herd information. After the information for the herd comes up on the screen, press F8 to see the RHS values. Follow the directions on the screen to change the following:

Calcium percentage — increase minimum percentage to 0.8-0.9% of the total diet
Magnesium percentage — increase minimum percentage to 0.25% of the total diet

- 5) Information provided on feed tags is listed on an as-fed basis. (Grain mixes are 90% dry matter.) If you are using information provided by a feed company, make sure you know if it is on an as-fed or dry matter basis. You need to enter the nutrient composition of a commercial mix or any other feedstuff on a dry matter basis.

To convert from as fed to dry matter:

$$\text{Nutrient composition (dry matter basis)} = \frac{\text{nutrient composition (as fed)}}{\% \text{ dry matter}} \times 100$$

Step 2: Inputting information into the Dart Ration Computer Program

Organization of the Main Menu (first screen after title screen)

- 1-Edit HERD production set in memory.
Used to edit information about the herd stored in computer's memory.
- 2-Edit FEED set in memory.
Used to edit information about feeds that can be fed. This information is stored in the computer's memory.
- 3-Select another HERD set from disk -- or create new HERD set.
Used to retrieve information about a herd you worked with previously or create a new herd set.

- 4-Select another FEED set from disk -- or create a new FEED set.
To select a feed set for a farmer you worked with previously or create a new feed set for a farmer.
- 5-Formulate ration using HERD & FEED sets in memory.
Used to balance a least cost ration.
- 6-Compare ration fed with requirements using HERD & FEED sets in memory.
Used to evaluate a farmer's current feeding program.
- 7-Go to special maintenance functions submenu.
Used to access set-up parameters, copy feed and herd sets, and delete herd and feed sets stored on disk.

This program is menu driven. Read the bottom of each screen for an explanation of keys to press to make changes and to move around within the program.

Part A: Inputting information about the herd - Main menu: option #3

- 1) To create a new herd set for a herd you have not worked with previously:
 - a) Answer Y for yes.
 - b) Enter name of herd or group of cows or heifers (maximum of 8 letters).
 - c) Enter information as requested — see step 1 for suggested ranges for values.
- 2) To retrieve a herd you have worked with previously:
 - a) Answer N for no.
 - b) Type in the name of the herd to retrieve from the listing on the screen.
 - c) Edit information to reflect current situation — make sure average daily milk production and feeding date are correct.

Part B: Inputting feed information - Main menu: option #4

- 1) To create a feed set for a herd you have not worked with previously:
 - a) Answer Y for yes.
 - b) Enter 8-letter name to identify feed set.
 - c) A blank feed “page” will appear on the screen to enter the first forage fed.
 - 1) Insert information requested. You must answer the first three cells (parts A, B, and C listed below) before the program will let you enter the next feedstuff.
 - A) Enter feed number to identify feed. (See feed codes, page 19, or press F8 for a listing by type of forage or concentrate, or you can search for a feed using a key phrase.)
 - B) Enter how the feed will be fed. Choices are:
 - i) B = fed separately or blended in total mixed ration
 - ii) C = fed as part of a concentrate or mineral mix
 - iii) S = second concentrate mix
 - C) Enter price and code for price. Choices are:
 - i) T = price/ton
 - ii) C = price/cwt
 - iii) B = price/bushel
 - iv) L = price/pound
 - D) Enter amount fed - used only when you want to specify minimum and/or maximum amount to feed.
 - i) Minimum and maximum must be different. If the same amount for minimum and maximum is listed, the computer randomly uses a 0.1 lb difference.
 - ii) Certain feeds have maximum amounts which should be fed.
 - E) Rtn-Cmp Amt/Cow (ration comparison amount fed per cow) - only needed when evaluating the nutrient adequacy of a ration for a particular group of cattle.
 - i) Enter amount of the feedstuff currently fed to each animal.
 - ii) These amounts are used to evaluate the farmer's current ration for this group of cattle.

- F) Enter nutrient analysis for forage from forage analysis. Missing nutrient analysis values can be filled in using the master or book values. To enter master values, press enter in each cell or press F1 to insert the master values for the remainder of the missing values and a blank feed “page” will appear on the screen.
 - d) Enter the remaining forages repeating steps A through F listed above.
 - e) For concentrates:
 - 1) Enter feed number, how it will be fed, and price.
 - 2) Press F1 to insert master-file values for nutrient analysis.
 - f) When finished, press F10 to exit.
- 2) To use a feed set already stored on disk:
- a) Answer N for no when asked if you want to create a new feed set.
 - b) Enter name of feed set you want to retrieve from the list on the screen.
 - c) Make changes in feed set to reflect current forage analysis and concentrates fed.
 - d) When finished, press F10 to exit and save changes.

Step 3: Evaluating a farmer’s current feeding program. (Comparison of a ration fed with requirements.)

Part A: Generating the computer printout

- 1) Using option #6 in the main menu, the nutritional requirements for a group of cows, dry cows, or heifers can be compared to the amount of nutrients supplied by the diet. The computer program will use the feed set and herd information in memory listed under main menu option #1 and #2 for the herd and feed information.
- 2) When asked, enter the amounts of each feed fed. Another option is to enter the amount of each feedstuff consumed in the feed set for each feed (Main Menu #2) in the column labeled “RTN-COMP AMT/COW.”

Part B: Evaluating a ration comparison report (what to look at)

Screen 1: Herd information

Check information about the cattle to make sure the computer picked up the information correctly. When you make any changes in the herd information (under #1 in the Main Menu), you must press <ENTER> for your changes to be saved.

Screen 2: Current feeding program

Check the amount of each feed the average cow in the herd consumes. Do these amounts match up with the amounts reported by the farmer?

Screen 3: Concentrate mix fed

This screen shows the nutrient and ingredient composition of the grain mix. Notice that the nutrient and ingredient composition are on an as-fed basis.

Screen 4: Feed ingredients listing

Listing of feedstuffs available to feed cattle. The nutrient composition, price, and limits on intake also are listed on this screen beside each feedstuff. You can use this screen to spot if you accidentally misentered the nutrient composition of a feed.

Screen 5: Feeding program

Make your comparison of the farmer's feeding program based on the first three columns on this screen. These columns list the amounts of each nutrient the ration contains, the computed requirements for each nutrient, and the difference between these two values.

- 1) Dry matter intake: Feed intakes need to be measured. Guessing feed intakes is just that, a guess and no more.

Actual dry matter intakes should be within two lb of the computed dry matter intake. If the amount of dry matter consumed is less than the expected amount, first remeasure forage and grain intakes. If forage and grain intakes are correct, then cows may not be consuming enough feed and need to be fed more. Possible problems: not enough forage is being offered, or the dry matter of the forages may be different than that used in the computer program.

If the dry matter intake is larger than expected, remeasure amounts of each feed fed. Cows may be consuming more than expected, but you need to recheck intakes and make sure you have accounted for feed wasted and amount fed to other groups of cattle, such as dry cows and heifers. Hay consumption from large round bales oftentimes is over estimated. Remember to account for storage and feeding losses and changes in bale weights from manufacturer's specifications.

- 2) If any of the nutrient concentrations listed are negative, you need to correct the nutrient inadequacy to ensure that production is not compromised.
- 3) If any of the nutrient concentrations are positive and quite a bit over the recommended amounts, you may be able to rebalance ration and save the farmer some money.

Be careful when reducing the amounts of protein, etc., in the ration. If haylage (dry matter greater than 60%) or other feedstuffs with possible heat damage are fed, more crude protein must be fed to meet the cows' requirements. Before reducing the nutrient density (unless grossly overfeeding energy and protein), please check with Donna Amaral-Phillips.

Step 4: Balancing a least-cost ration.

Generally, more than one run is needed before a ration is balanced and fits a farmer's feeding program.

Part A: Balancing a least-cost ration

- 1) While in the main menu, use option #5.
- 2) If the ration balances:
 - a) Check to see that the information has been keyed in correctly.
 - b) Look at the ration suggested:
 - 1) Does it look realistic?
 - 2) Will the cattle eat that amount of feed?
 - 3) Does the ration formulated match the requirements of the cattle?
 - 4) Look at the forage-to-concentrate ratio.
 - Is there enough forage in the complete diet?
 - 5) Does the total ration contain greater than 50% moisture?
 - 6) Are the trace mineral requirements of the cow being met?
 - 7) Look at the feed cost. Is it realistic?
 - c) Make changes in the amounts of feedstuffs fed until you arrive at a solution that looks realistic for the producer.
- 3) If the ration does not balance, a message on the screen will indicate why the program could not balance a ration.

Part B: How to evaluate a least-cost ration you have balanced for a farmer's group of cattle:

Screen 1: Information about the herd

Check information entered about the dairy cattle to make sure it is correct. After you make any changes in the herd or feed set information (under option #1 or #2 in the Main Menu), you must press <ENTER> in order for the computer to save the changes.

Screen 2: Amounts of each feedstuff to feed each cow or heifer daily

- 1) What feedstuffs has the computer program used to balance the ration?
- 2) Has the program used the forages in the amounts or ratios the farmer wants to feed?
- 3) Does this feeding program fit the farmer's feeding situation and management style?

Screen 3: Composition and analysis of concentrate mix (if you asked the computer to make one)

- 1) What is the protein percentage of the grain mix? This program balances for least cost and, sometimes, to meet the cows' nutritional needs, a high or very low protein concentrate will suffice. If the protein percentage is high, will the farmer feed this grain mix, or does the protein content need to be reduced? This can be done by forcing the program to use more corn or other low protein grain.
- 2) Does the farmer have any preconceived ideas about the ratio of various feedstuffs in the cattle's grain mix? For example, does the farmer want to use one part distillers grain to two parts soybean meal as the protein component of this grain mix?

Screen 4: Mineral mix needed

If the program is not given a source of macro minerals (e.g., calcium and phosphorus), it will formulate a mineral mix using dicalcium phosphate, limestone, trace mineralized salt, and other minerals as needed. This screen will show the calcium/phosphorus ratio needed in a commercial mineral mix.

Do not give farmers a ration using trace mineralized salt unless you have cleared the trace mineralized salt with Donna Amaral-Phillips. Most trace mineralized salts will not provide adequate amounts of the trace minerals and/or contain sources which do not provide cattle with the needed trace mineral. Trace minerals are needed in small quantities for milk production, growth, reproduction, and immune function.

Screen 5: Feedstuffs the program can use to balance a ration

The program lists feedstuffs it can use to balance a ration. The nutrient composition, price, and limits on intake also are listed on this screen beside each feedstuff. You can use this screen to spot if you accidentally misentered the nutrient composition of a feedstuff.

Screen 6: Feeding program

This screen shows the nutrient composition of the total diet if the average cow or heifer consumes all the feed listed.

General goal: The nutrient content of the ration should meet but not greatly exceed the cow's or heifer's computed minimum requirements.

Specifics to consider (problems that you may encounter):

- 1) **Low quality forages:** When low quality forages are fed, energy quickly becomes the limiting factor. The computer program tries to bring in energy from grain sources and may make the protein concentration the maximum amount allowed within the program. **Check to see that the program did not increase the protein concentration to the maximum to get as much energy as possible in the ration.** If this happens, add another high-energy source (switch to shell corn or high-fat feeds) to bring down feed costs while meeting energy needs. This seems to happen more often with low quality forages when ear corn is used as the energy source in the grain mix.
- 2) **Excellent quality forages:** The program may try to bring in minerals to cheaply meet the dry matter needs of the cow. Watch that the percentages of calcium, potassium, and other macro minerals are not supplemented at extremely high rates.

Besides having the nutrient composition of the ration match up with the computed minimum requirements of the cow, check the following:

- a) Calcium to phosphorus ratio should be between 1.5:1.0 and 2.1:1.0.
 - b) Total ration moisture content: not greater than 50% moisture.
- 3) **Forage-to-Concentrate Ratios:** For a herd, do not formulate rations with a forage-to-concentrate ratio any lower than 45:65. Rations should be balanced to provide a certain amount of energy, protein, and non-structural carbohydrates (NSC) and not on forage-to-concentrate ratios. However, forage-to-concentrate ratios can be used as an indication of the amount of fiber (if forages are not chopped too finely) coming from forages.

Ideally, with excellent quality forages and good milk production, expect to have the following forage-to-concentrate ratios:

- Early-lactation cows - 50:50
- Mid-lactation cows - 60:40

Screen 7: Binding constants on the program

The majority of the cost of a ration should be associated with energy and/or protein. If the majority of the cost is associated with minerals, carefully review the solution you obtained.

Screen 8: Economic analysis

This screen shows the price/ton at which the computer program would have used more of a feedstuff to reduce the cost of the total diet. This program assumes that the price of only one feedstuff changes at a time.

If you used a minimum and maximum for various ingredients, the prices at which the amount of these will be increased or decreased will be \$0.00 or a negative dollar amount.

Screen 9: Competitive price/ton for feeds not included in the ration

This screen shows the price at which it would be economically advantageous to use a particular feedstuff (nutritional value) not used in the balanced ration.

Step 5: Fax all printouts to Donna Amaral-Phillips for review before giving them to the farmer.

If you want Donna Amaral-Phillips to look at the balanced ration or feed comparison, the information found on the printout can be faxed to me. I would highly encourage all agents to have me review rations before they are given to the farmer.

If you have any questions or do not understand how to run the program, please contact Donna M. Amaral-Phillips at (606) 257-7542.

Information Sheet For Balancing Dry Rations

Name _____ Today's Date _____

Address _____ County _____

_____ Local Mill _____

Phone # (_____) _____

Information about Group of Milking or Dry Cows:

Number cows fed this ration _____ Avg. daily milk _____

Breed _____ Avg. % butterfat _____

Avg. body weight _____ Milk price _____

Avg. # days in milk _____ Expected feeding date _____

Information about Heifers:

Number of heifers in group _____

Avg. weight of heifers in group _____

Breed size: Large (Holsteins, Brown Swiss, Guernsey) _____

Small (Jerseys) _____

Expected rate of gain (lb/day) between 1.0 - 2.0 lb/day _____

Current feeding program: (check appropriate blank or blanks)

_____ Total mixed ration _____ Grain in parlor/stanchion

_____ Computer feeder _____ Top-dress silage with grain

_____ single
_____ dual (List grain mix in each bin)

Comments _____

What changes would you like to consider in your feeding program?

Feedstuffs:

Forages

| Forages fed (includes pasture) | Amount fed (lb/cow/day) | Forage** Inventory (Total amt on hand) | Stage of maturity harvested (sample sent to lab) |
|-----------------------------------|----------------------------|---|--|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

** List silo size or number of bales of hay & weight of bales

Grain mix:

Avg. amount of grain fed per cow or heifer _____

Composition of current grain mix:

| Mix #1 | | Mix #2 | |
|--------------------------|-----------------------|--------------------------|-----------------------|
| type of grain or mineral | amount added to batch | type of grain or mineral | amount added to batch |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

Cows or heifers limited to a maximum of _____ lb grain per day

Grain batch size desired _____ lb.

Energy sources

| | Price |
|--------------|-------|
| Shelled corn | _____ |
| Ear Corn | _____ |
| _____ | _____ |
| _____ | _____ |

Protein sources

| | Price |
|-------------------------|-------|
| Soybean meal (44%) | _____ |
| Distiller's Grain (dry) | _____ |
| _____ | _____ |
| _____ | _____ |

Buffers/Additives

| | Price |
|--------------------|-------|
| Sodium bicarbonate | _____ |
| Magnesium oxide | _____ |
| _____ | _____ |
| _____ | _____ |

Minerals

| | Price |
|---|-------|
| Dicalcium phosphate | _____ |
| Limestone | _____ |
| Trace mineralized salt (Need feed tag) | _____ |
| Vitamins A, D & E (Need feed tag) | _____ |

Comments _____

Feed Codes Assigned To Feed Ingredients

F1 - Hay/Roughage

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|---------------------|-------|--------------------|-------|-------------------|
| 103 | Alfalfa Hay E.B. | 104 | Alfalfa Hay M.B. | 105 | Alfalfa Hay F.B. |
| 106 | Alfalfa Hay Mature | 107 | Mostly Grass Hay | 108 | Barley Hay |
| 109 | Mostly Legume Hay | 110 | Coastal Berm. Hay | 114 | Alsike Clover Hay |
| 115 | Ryegrass Hay (Ital) | 116 | Ladino Clover Hay | 117 | Red Clover Hay |
| 120 | Johnsongrass Hay | 121 | Fescue Hay-Mature | 122 | Fescue Hay F.B. |
| 124 | Lespedeza Hay | 126 | Oats Hay | 127 | Orchardgrass Hay |
| 128 | Sudangrass Hay | 129 | Soybean Hay | 132 | Timothy Hay |
| 134 | Vetch Hay | 135 | Wheat Hay | 136 | Peanut Hay |
| 150 | Dehy Grnd Alfalfa | 153 | Corn Fodder | 154 | Corn Stover |
| 155 | Ground Corn Cobs | 157 | Cottonseed Hulls | 158 | Straw-Cereal Gr. |
| 159 | Rice Hulls | 160 | Grain Sor Fodder | 162 | Whole Cottonseed |
| 163 | Soybean Straw | 164 | Peanut Hulls Grnd | 165 | Peanut Hulls |
| 166 | Bagasse Pellets | 168 | Berm-Grass Pellets | | |

F2 - Pasture

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|--------------------|-------|--------------------|-------|---------------------|
| 201 | Alfalfa Fresh | 207 | Ky Bluegrass Fresh | 211 | Carrot |
| 214 | Red Clover Fresh | 215 | Sw. Corn Can Res | 218 | Lespedeza Fresh |
| 220 | Fescue Fresh | 222 | Orchardgrass Fresh | 223 | Redtop Fresh |
| 224 | Ryegrass Fresh | 226 | Sudangrass Fresh | 228 | Timothy Fresh |
| 229 | Wheat Fresh | 233 | Bahia Fresh | 234 | Bermuda-Alicia Fres |
| 235 | Bermuda-Coastal Fr | 236 | Bermuda-Common Fr | 237 | Johnsongrass Fresh |
| 238 | Millet Fresh | 240 | Oats Fresh | 242 | Rye Fresh |
| 245 | Sor-Sudan (Sudex) | 247 | Legume-Grass Fresh | | |

F3 - Silages/Haylages

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|--------------------|-------|---------------------|-------|--------------------|
| 302 | Wilted Alf. Silage | 305 | Alfalfa Silage | 310 | Barley Silage |
| 312 | Citrus Pulp Silage | 313 | Corn Silage | 315 | Corn Stover Silage |
| 316 | Ear Corn Silage | 317 | Corn-Soybean Silage | 319 | Grass-leg. Silage |
| 321 | Oats Silage | 324 | Grain Sorghum Sil. | 325 | Forage Sorg. Sil. |
| 326 | Sudangrass Silage | 327 | Soybean Silage | 328 | Timothy Silage |
| 329 | Wheat Silage | 330 | Rye Silage | 351 | Alfalfa Haylage |
| 352 | Grass-Leg Haylage | 354 | Corn Haylage | | |

F4 - Grass/By-products

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|---------------------|-------|-----------------------|-------|-------------------------------|
| 398 | A-V Fat Blend | 399 | Calcium Soap(Megalac) | 400 | Fatty Acid Prills |
| 401 | Animal Fat | 402 | Barley Grain | 406 | Dried Beep Pulp |
| 408 | Dry Beet Pulp w/Mol | 409 | Dried Citrus Pulp | 410 | Corn Grain-Ground |
| 411 | Corn Grain-Cracked | 412 | H.M. Shelled Corn | 413 | Corn & Cob Meal (Ear Corn) |
| 414 | Grain Screenings | 415 | H.M. Ear Corn | 416 | Hominy Feed |
| 417 | White Hominy Feed | 418 | Mazoferm .L. | 419 | Dried Cane Mol. |
| 420 | Cane Molasses | 421 | Citrus Molasses | 422 | Sugar Beet Mol. |
| 423 | Oats Grain | 425 | Oat Middlings | 432 | Rice Bran |
| 433 | Pol. White Rice | 434 | Safflower Seeds | 436 | Sorg. Milo Grain |
| 437 | Milo Grain - Rolled | 440 | Wheat Grain | 443 | Wheat-Soft Winter |
| 447 | Wheat Bran | 448 | Wheat Shorts | 449 | Wheat Middlings |
| 450 | Wheat Mill Run | 451 | Wheat Screenings | 452 | Dried Whey |
| 453 | Maltlage | 454 | Dried Bakery Prod. | 455 | Maltlage-22 |

F5 - Protein Supplements

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|---------------------|-------|---------------------|-------|---------------------|
| 502 | Brewers Dried Gn. | 503 | Corn Dis Dried Gn. | 504 | Corn Grain W Sol |
| 506 | Corn Gluten Meal | 507 | Corn Gluten Feed | 510 | Soybean Hulls |
| 511 | Pressed Cot-Seed | 512 | 36% Cottonseed Meal | 513 | 41% Cot Sd Meal.Sp |
| 514 | 48% Cottonseed Meal | 515 | 41% Sol. Exp. CSM | 516 | 41% Prepress CSM |
| 517 | Linseed Meal Mechex | 527 | Meat Bone Meal | 529 | Peanut Meal Sol-Ext |
| 531 | Sunflower Seed Meal | 537 | 44% Soybean Meal | 538 | 48% Soybean Meal |
| 539 | Soybeans-Steamed | 543 | Urea | 544 | Super-Blend 65 |
| 545 | Soybeans | 546 | Wet Brewers Grains | | |

F6 - Minerals

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|---------------------|-------|---------------------|-------|---------------------|
| 601 | Feeding Bone Meal | 602 | Steamed Bone Meal | 603 | Mono-Dicalcium Phos |
| 604 | Dicalcium Phosphate | 605 | Def. Rock Phosphate | 606 | Calcitic Limestone |
| 607 | Salt | 608 | Magnesium Oxide | 609 | Monosodium Phosph |
| 610 | Sodium Sulfate | 611 | Sod. Tripolyphosp | 612 | Trace Min. Salt |
| 613 | Calcium Sulfate | 614 | Dyna-Mate | 615 | Monoamm Phosphate |
| 616 | Tricalcium Phos | 617 | Potassium Chloride | 618 | Iron Sulfate |
| 619 | Oystershell | | | | |

F7 - Commercial Complete Grain Mixes

| Feed# | Name | Feed# | Name | Feed# | Name |
|-------|--------------------------------|-------|--------------------------------|-------|--------------------------------|
| 912 | 12% Dairy Feed (med energy) | 913 | 12% Dairy Feed (low energy) | 916 | 16% Dairy Feed (med energy) |
| 917 | 16% Dairy Feed (low energy) | 918 | 18% Dairy Feed (med energy) | 919 | 18% Dairy Feed (low energy) |
| 920 | 20% Dairy Feed (med energy) | 921 | 20% Dairy Feed (low energy) | 922 | 22% Dairy Feed |
| 924 | 24% Dairy Feed | 928 | 28% Dairy Feed | 932 | 32% Dairy Feed |
| 936 | 36% Dairy Feed | 938 | 38% Dairy Feed | 940 | 40% Dairy Feed |
| 944 | 44% Dairy Feed | | | | |

F8 thru F10 - User defined feeds

Educational programs of the Kentucky Cooperative Extension Service serve all people regardless of race, color, age, sex, religion, handicap, or national origin.

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