AgNext FACT for Dairy User Guide

The AgNext Feed Additive Calculator Tool (FACT) for Dairy is intended to be a tool for producers to estimate methane emissions in dairy cows and also to make decisions about feed additives on their operations. This user guide will define each of the inputs within the AgNext FACT for Dairy. Please refer to the underline video tutorial for an in-depth demonstration on how to use and understand the tool.

- **Inputs**
  - **Rations**
    - Dry matter intake: pounds of dry matter per head per day
    - NDF: See the "Finding NDF Content of Lactating Dairy Cow Rations" instructions beginning on page 3.
    - Ration cost: costs of rations per head per day
  - **Performance**
    - Body weight: Input the starting weight of the animal
    - Average daily gain: Rough estimate of how much the animal is gaining per day
  - **Milk Production and Composition**
    - Milk production: Input the pounds per day
    - Milk fat: Input as a percentage
    - Milk protein: Input as a percentage
    - Other milk solids: Input as a percentage
  - **Milk Prices:** latest USDA prices can be found here
    - Milk pool price: Input price divided by hundred-weight
    - Butterfat price: Input as price divided by pounds
    - Other solids price: Input as price divided by pounds
    - Other premiums: Input as price divided by pounds
  - **Feed Additives:** can be inputed for user to understand different percent reductions
    - Estimated impact on methane production: Percent difference from baseline. Reduction should be inputted as a negative percentage
    - Estimated impact on dry matter intake: Can put in positive or negative numbers
    - Estimated impact on milk production: Can be neutral, positive, or negative
    - New milk fat yield: New estimate of milk fat yield given additive use
    - Milk protein yield: New estimate of milk protein yield given additive use
    - New milk other solids: New estimate of other solids yield given additive use
    - Additive costs: Can be inputted to understand how feed additive costs can impact an operation
    - Carbon price: Looks at the actual price of what one would be paid for reducing emissions.
      - More resources about carbon prices can be found at:
        - https://carboncredits.com/carbon-prices-today/
        - https://agnext.colostate.edu/carbon-markets/

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- **Outputs**
  - Baseline scenario: Shown in green
  - Additive scenario: Shown in orange
- **Charts**
  - Total enteric emissions as pounds of CO_2e per head per day
    - Can see the baseline scenario in green compared to the additive scenario in orange. Can see how the usage of a feed additive impacts methane emissions compared to the baseline.
  - Total enteric emissions as pounds of CO_2e over hundred-weight
    - Can see the baseline scenario in green compared to the additive scenario in orange. Similar to above, but looking at pounds of CO_2e over hundred-weight.
  - Total enteric emissions kg CO_2e per kilogram of fat and protein corrected milk
    - Can see the baseline scenario in green compared to the additive scenario in orange. Similar to above, but looking at kg CO_2e per kilogram of fat and protein corrected milk.
  - Income over feed costs: price over hundred-weight
    - Based on the economic inputs entered into the form this chart show what the actual cash in/cash out is in the given scenario comparing the baseline in green with the additive scenario in orange.
  - Gross margin: shows the difference between the baseline scenario and feed additive scenario. If this amount is shown in red, that would indicate that one is losing money on that feed additive scenario. If it is shown in green, that means an individual is making money in the given scenario.

Visit <u>agnext.colostate.edu/dairy-fact</u> for a detailed instructional video and more information about the AgNext FACT for Dairy

Connect with AgNext

Finding NDF Content of Lactating Dairy Cow Rations

This document covers finding the NDF content of dairy rations for the most common feeding management programs and feed analysis results. If you are using one of these programs, follow the steps to find the value.

Table of Contents

AMTS.Cattle Professional Management Console

Step 1. After loading your Farm, select the Group/Ration Comparison Report.

Step 2. Select the appropriate barn and select "View Report"

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AMTS.Cattle Professional Management Console

Step 3. Find the cell titled "Forage NDF (% DM)". Input this value into cell D18 of the AgNext Feed Additive Calculator Tool (FACT) for Dairy.

National Dynamic System – NDS Professional

Step 1. From the "Main" tab, select the lactating cow ration from the barn

Step 2. Locate the diet evaluation.
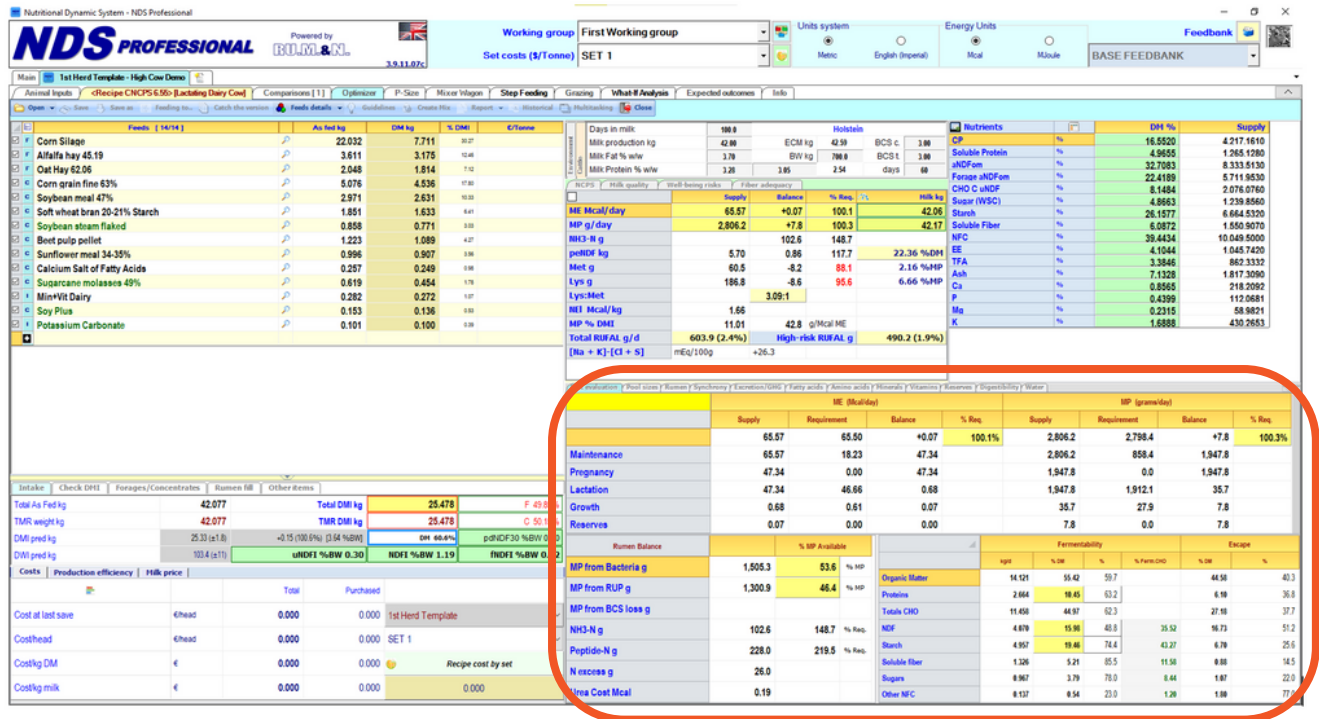
National Dynamic System – NDS Professional

Step 3. Under Fermentability, find the NDF content as a percentage of dry matter.

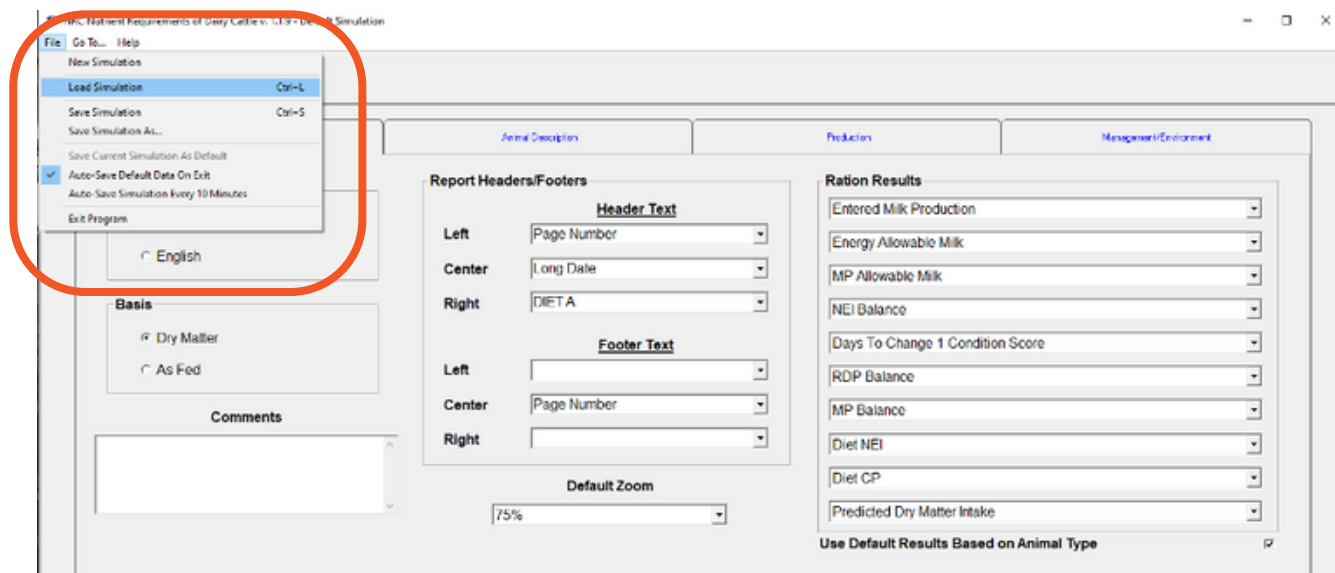**Step 4.** Input the NDF (% DM) into cell D18 of the AgNext Feed Additive Calculator Tool (FACT) for Dairy.

NRC Nutrient Requirements of Dairy Cattle
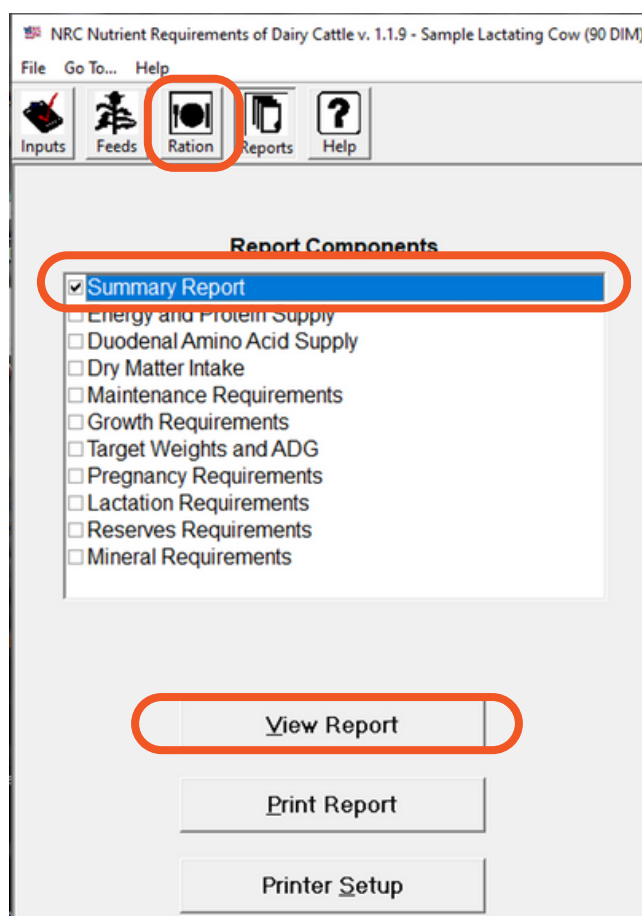
Step 1. Load the appropriate simulation file.

Step 2. Select the Reports tab and check the Summary Report line from the list and view report.

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NRC Nutrient Requirements of Dairy Cattle

Step 3. In the Summary Report, locate the second page of the report

Step 4. Under Diet Concentrations, locate NDF

NRC Nutrient Requirements of Dairy Cattle

Step 5. Input the NDF (% DM) into cell D18 of the AgNext Feed Additive Calculator Tool (FACT) for Dairy.

Diet Concentrations

NDF : 31.2 (%DM)
Forage NDF : 24.5 (%DM)
ADF : 20.6 (%DM)
NFC : 42.9 (%DM)
Undiscounted TDN : 75 (%DM)
ME : 2.48 (Mcal/kg DM)
NE1 : 1.58 (Mcal/kg DM)
NEg : 1.19 (Mcal/kg DM)
Ca : 0.6 (%DM)
P : 0.4 (%DM)
Ether-Extract : 6.0 (%DM)
DCAD : 170 (mEQ/kg)

Target Diet Concentrations

NE1 : 1.61 (Mcal/kg)
MP : 116 (g/kg)

Ca : 3 (g/kg)
P : 3 (g/kg)

Diet Summary

Feed Name	kg/day (Dry Matter)	kg/day (As-Fed)	% (Dry Matter)
Legume Forage Hay, immature	5.41	6.43	18.02
Corn Silage, normal	12.01	34.22	39.99
Corn Grain, steam-flaked	6.61	7.50	22.01
Calcium soaps of fatty acids	0.30	0.31	1.00
Tallow	0.30	0.30	1.00
Cottonseed, Whole with lint	2.25	2.50	7.49
Soybean, Meal, solv. 48% CP	2.40	2.68	7.99
Blood Meal, ring dried	0.15	0.17	0.50
Calcium Carbonate	0.03	0.03	0.10
MonoSodium Phosphate (1 H2O)	0.06	0.06	0.20
Salt	0.15	0.15	0.50
Vitamin premix 1	0.36	0.36	1.20

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Commercial Lab Results Example
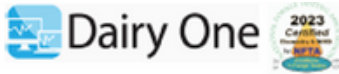
Dairy One

```
FORAGE TESTING LABORATORY
DAIRY ONE, INC.
730 WARREN ROAD
ITHACA, NEW YORK 14850
607-257-1272    (fax 607-257-1350)
```

```
-------- -------- -------- -- --
|Sampled | Recvd  |Printed |ST|CO|
|07/13/23|07/17/23|07/26/23|  |  |
-------- -------- -------- -- --
```

```
    19MAR2023
Colorado State University
1171 Campus Delivery
Fort Collins, CO 80523
```

```
--------------------------
   ENERGY TABLE - NRC 2001
--------------------------
           Mcal/Lb  Mcal/Kg
           -------  -------
DE, 1X      1.64     3.62
ME, 1X      1.45     3.20
NEL, 3X     0.86     1.90
NEM, 3X     0.91     2.00
NEG, 3X     0.61     1.35
--------------------------
TDN1X, %      82
--------------------------
```

```
COMMENTS:
 1.THIS REPORT HAS BEEN CORRECTED
   TO REFLECT NEW ANALYSIS
   RESULTS, SAMPLE KIND CODE OR
   NAME AND ADDRESS FIELDS.
   PLEASE COMPARE IT WITH YOUR
   ORIGINAL.
```

Sample Description	Farm	Code	Sample
CORN SNAPLAGE, Dry		437	29388620

GREEN

Analysis Results

Components	As Fed	DM
% Moisture	7.2	
% Dry Matter	92.8	
% Crude Protein	11.6	12.5
% Adjusted Crude Protein	11.6	12.5
Soluble Protein % CP		42
% ADF	10.4	11.2
% aNDF	17.9	19.3
% Lignin	1.4	1.5
% NFC	56.5	60.9
% Starch	50.5	54.4
% Ash	3.40	3.67
% TDN	75	81
NEL, (mcal/kg)	1.85	2.00
NEM, (mcal/kg)	1.85	1.99
NEG, (mcal/kg)	1.25	1.34
% Calcium	.52	.56
% Phosphorus	.35	.37
% Magnesium	.16	.18
% Potassium	.79	.85
% Sodium	.106	.115
PPM Iron	142	153
PPM Zinc	73	78
PPM Copper	14	15
PPM Manganese	47	50
PPM Molybdenum	< 1	< 1
% Sulfur	.15	.16
% Crude Fat, EE	3.46	3.72
Gross Energy, cal/g	4,164	4,488

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