Project: Dairy Feeding Framework

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Course: CS 4624: Multimedia, Hypertext, and Information Access

Instructor: Dr. Edward A. Fox

Location: Virginia Tech, Blacksburg VA 24061

Date: 04/22/2021

Image: https://www.chicagoparent.com/learn/milking/
Outline

- Brief Description
- Current Progress
- Future Plan/Finishing Up
- Acknowledgement
Provide easy-to-use framework for dairy nutritionists to adjust individual cow diets for efficient milk production.
Current Progress
User Login

- Login/Create Account
- Email verification for account creation

Log In!

Username/Email*

Password*

Log in

Forgot your password? Password Reset

Need an Account? Sign Up Now For Free!
User Dashboard

- Able to view/add farms to their profile
- (Admin only) able to import Select Sires and TMR data
- Left panel: multi-tab for specific selections
User Ingredients

- Able to see list of default ingredients
- Able to copy and edit default ingredients
- Able to edit or copy custom ingredients
User Mixes

- Able to view all ingredients mixes
- Can edit/delete mixes
- Can create a new mix
User Mixes (Create)

- Select ingredients for mixture
- Set a name for mixture
- Set ingredients ratio based on dry matter
- Ratio must total to 100% otherwise creation fails
User Diets

- Must select a farm to view/edit diets
User Diets

- Able to view all diets specific to selected farm
- Can edit/delete diet
- Can create new diet
User Diets

- Select ingredients mixture for diet
- Set a name for diet
- Set mixture weight in pounds
- Set date when diet given
- Select animal/pen where diet was used
Ingredients Storage

- View storage unit of all ingredients and its location
- Can add/edit storage
Select Sires

- Admin Privilege Only
- Upload Select Sires data to database
Select Sires (Animal Example)

- Upload correct data obtained from Select Sires
Analytics with R
<table>
<thead>
<tr>
<th>ID</th>
<th>File Name</th>
<th>Date Ran</th>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Runs R Analysis/Report**
Analytics with R

View Analysis/Report
3/17/2021

1. Establish MySQL connection and get data from all relevant tables.

Average Pen Performance this Week

This week’s average pen performances

<table>
<thead>
<tr>
<th>Lactation</th>
<th>Days in Milk</th>
<th>DMI (kg)</th>
<th>Milk Production (kg)</th>
<th>Protein (%)</th>
<th>Fat (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.95</td>
<td>102.25</td>
<td>TBD</td>
<td>+7.15</td>
<td>-0.10</td>
</tr>
<tr>
<td>R</td>
<td>1.51</td>
<td>138.01</td>
<td>TBD</td>
<td>+3.29</td>
<td>+0.08</td>
</tr>
<tr>
<td>A</td>
<td>2.53</td>
<td>266.76</td>
<td>TBD</td>
<td>+2.11</td>
<td>-0.00</td>
</tr>
<tr>
<td>B1</td>
<td>1.93</td>
<td>41.62</td>
<td>TBD</td>
<td>+4.55</td>
<td>NA</td>
</tr>
<tr>
<td>B2</td>
<td>2.75</td>
<td>276.00</td>
<td>TBD</td>
<td>-4.14</td>
<td>+0.05</td>
</tr>
<tr>
<td>B3</td>
<td>2.40</td>
<td>278.20</td>
<td>TBD</td>
<td>-0.24</td>
<td>-0.02</td>
</tr>
<tr>
<td>Transition</td>
<td>1.87</td>
<td>13.40</td>
<td>TBD</td>
<td>+7.33</td>
<td>+0.08</td>
</tr>
</tbody>
</table>

1 (Data compared between 13/12/2020-19/12/2020 and 20/12/2020-26/12/2020)

Average Pen Performances This Week

Stats for Pen 'C'

<table>
<thead>
<tr>
<th>Metric</th>
<th>Mean</th>
<th>Median</th>
<th>Variance</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>109.66</td>
<td>115.2</td>
<td>542.24</td>
<td>59.6</td>
<td>150.6</td>
</tr>
<tr>
<td>DMI</td>
<td>-1.00</td>
<td>-1.00</td>
<td>-1.00</td>
<td>-1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>3.03</td>
<td>3.0</td>
<td>0.08</td>
<td>2.6</td>
<td>3.8</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>3.49</td>
<td>3.6</td>
<td>0.80</td>
<td>1.5</td>
<td>4.9</td>
</tr>
<tr>
<td>Somatic Cell Count</td>
<td>74.06</td>
<td>31.0</td>
<td>9065.93</td>
<td>13.6</td>
<td>373.0</td>
</tr>
<tr>
<td>Health Events</td>
<td>0.03</td>
<td>0.0</td>
<td>0.03</td>
<td>0.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

1 (Data analyzed between 20/12/2020-26/12/2020)
Admin Page

- Holds all the data uploaded or fetched
- Admin can view data tables and users accounts
Finishing Up

04/16
R Connection Setup for Analytics

04/23
Testing Functionality & Visualization

04/30
Complete Docker Website Setup
Project Acknowledgement

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Undergraduate Research Assistant
References

Citations:
https://www.selectsires.com/

Images:
https://www.chicagoparent.com/learn/milking/
https://www.flaticon.com/svg/vstatic/svg/2395/2395765.svg?token=exp=1612891328~hmac=7ec78423b43049cab21f11e379822ed0
https://www.flaticon.com/svg/vstatic/svg/2230/2230283.svg?token=exp=1612891328~hmac=7a6f4a21c44951c9cdeb92bb558baea
https://www.flaticon.com/svg/vstatic/svg/616/616528.svg?token=exp=1612891832~hmac=0c5fcacc9c28a834ab73d801af89cc65
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