SUMMIT 2019
National Animal Nutrition Program
Leveraging Resources, Linking Researchers
The National Animal Nutrition Program (NANP)

From Then to Now

Merlin D. Lindemann
NANP Coordinating Committee, Chairman
ANIMAL NUTRITION RESEARCH PRIORITIES FOR A HEALTHY SOCIETY

National Animal Nutrition Program, National Research Support Project-9
Summit 2019

Producing Food with Animals: Sustainability, Efficiency, and Security in the US

National Animal Nutrition Program, National Research Support Project-9
National Animal Nutrition Program

• Established in 2010; renewed (and expanded) in 2015.

• A research-support activity requested by stakeholders.

• Focus of the NANP:
  • Address challenges facing researchers, educators, and support agencies in animal agriculture and fill voids in the research and academic communities.
Funding and Governance

• NANP is one of seven National Research Support Projects.

• Administrative Advisors from four regions:
  – Bret Hess (Lead), University of Wyoming
  – Lesley Oliver, University of Kentucky
  – David Benfield, The Ohio State University
  – Rick Rhodes, University of Rhode Island

• National Program Leaders from USDA/NIFA:
  – Charlotte Kirk Baer (Lead)
  – Steve Smith
Structure of the National Animal Nutrition Program

- Coordinating Committee – M. Lindemann (UK)
- Feed Composition Committee – P. Miller (UNL)
- Modeling Committee – M. Hanigan (VT)
Coordinating Committee Members

- Merlin Lindemann (Chair), University of Kentucky
- Gary Cromwell (Past-Chair), University of Kentucky
- Todd Applegate, University of Georgia
- Don Beitz, Iowa State University
- Ryan Dilger (Feed Comp), University of Illinois
- Heidi Rossow (Modeling), University of California-Davis
- Nancy Irlbeck, Washington State University
- Jack Odle, North Carolina State University
- Delbert Gatlin, Texas A&M University
- Carey Williams, Rutgers
- Joel Caton, North Dakota State University
- Robin Schoen, National Academies/NRC (Liaison)
Feed Composition Committee Members

- Phil Miller (Chair), University of Nebraska
- Andres Schlageter – University of Nebraska
- Ryan Dilger, University of Illinois
- Bill Dozier, Auburn University
- Mark Edwards, Cal Poly – San Luis Obispo
- Alexander Hristov, Pennsylvania State University
- Brian Small, University of Idaho
- Mark Nelson, Washington State University
- Michael Lilburn, The Ohio State University
- Casey Bradley, DSM
- William Weiss, The Ohio State University
Modeling Committee Members

- Mark Hanigan (Chair), Virginia Tech
  - Veridiana De Souza Daley, Virginia Tech
- Heidi Rossow, University of California-Davis
- Tim Hackmann, University of Florida
- Ermias Kebreab, University of California-Davis
- Peter Ferket, North Carolina State University
- John McNamara, Washington State University
- Luis Tedeschi, Texas A&M University
- Nathalie Trottier, Michigan State University
- Mike VandeHaar, Michigan State University
- Dominique Bureau, University of Guelph
How Does the National Animal Nutrition Program Collaborate with NASEM (the National Research Council)?
Support

• Scientific and Technical
  – Development of a system for management of feed ingredient information, including a feed ingredient database.
  – Modeling support for establishment of nutrient requirements for agricultural animals (beef, dairy, swine, and poultry).
  – Assistance to requirement revision committees – respond as requested and as able to help meet their needs
Websites:

National Animal Nutrition Program

www.animalnutrition.org

Global Animal Nutrition Network

https://gann-nanp.org/expert
Who Are We?
The National Animal Nutrition Program (NANP) serves as a forum to identify high-priority animal nutrition issues and provides an integrated and systemic approach to sharing, collecting, assembling, synthesizing, and disseminating science-based information, educational tools, and enabling technologies on animal nutrition that facilitate high-priority research among agricultural species.

Learn More
Workshops & Symposia

Nutrition Modeling in R is an important component of nutritional research as diet formulation is a quantitative process. To design diets that meet or exceed the nutrient requirements of the species of interest, one must be able to predict the absorbed nutrient supply and the animal needs for those nutrients, or more robustly, animal responses to varying supply of the nutrients. Thus the construction and parameterization of models is prevalent in animal nutrition research. In the Nutrition Models Workshop you will learn modeling approaches required to construct, parameterize, and evaluate a model.


<table>
<thead>
<tr>
<th>Lecture</th>
<th>File</th>
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</thead>
<tbody>
<tr>
<td>3. The evolution of mathematical models for animal nutrition: what to expect next? <strong>Luis Tedeschi</strong>, Texas A&amp;M University. <a href="#">link</a></td>
<td>Download</td>
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</table>
Nutrient Requirement Models

Click the links below to begin downloading the linked document. To save the file to a particular location on your computer, right click on the link, select the “Save Target As” option and then choose the folder on your computer into which you would like the file to be saved.

**Nutrient Requirements of Beef Cattle: Eighth Revised Edition (2016)**

- Beef Cattle Model 2016

**Software Downloads: Nutrient Requirement Models of Beef Cattle** (Compatible with Windows 7 32-bit and 64-bit machines):

- NRC Beef Model (1996, 2000): Beef Set Up 1.0.3 (zip)

**Supportive Documentation for Above Programs** (The following documents are in PDF form):

- Modifications In the NRC Beef model (1996, 2000) and NRC Dairy model (2001) software

**Software Downloads: Nutrient Requirement Models of Dairy Cattle** (Compatible with Windows 7)
**Corn grain, dry** (Grain products)

**Ingredient:** Corn grain, dry

**Definition:** Dried seeds of Zea mays. Seeds could be ground or rolled (i.e. reduced in particle size by passing grains between rollers)

**AAFCO:** 48.4, Ground corn
**IFN:** 4-02-861, Maize, grain ground
**EU:** 1.2.1, Maize

**Alternate Names:**
- Corn grain dry, ground, Corn grain, rolled, Corn, yellow dent, Corn, yellow dent ground
- Scientific Name: Zea mays sp. mays

**DM Content (%):**
- As Fed: 100

**Display Basis:**
- As Fed

**Year Start**
- Year Start

**Year End**
- Year End

**Data Type**
- Peer Reviewed
- Commercial
- Academic

### Main Constituents

<table>
<thead>
<tr>
<th>Nutrient (percentage of dry matter)</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>CV</th>
<th>10th Percentile</th>
<th>90th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Dry Matter (DM, %)</td>
<td>400</td>
<td>88.10</td>
<td>2.00</td>
<td>2.27</td>
<td>85.81</td>
<td>90.38</td>
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<tr>
<td>Crude Protein (CP, %)</td>
<td>395</td>
<td>9.21</td>
<td>1.24</td>
<td>14.42</td>
<td>7.82</td>
<td>10.71</td>
</tr>
<tr>
<td>Crude Fiber (CF, %)</td>
<td>153</td>
<td>2.19</td>
<td>1.12</td>
<td>51.13</td>
<td>1.15</td>
<td>3.30</td>
</tr>
<tr>
<td>Ether Extract (EE, %)</td>
<td>306</td>
<td>3.99</td>
<td>1.07</td>
<td>26.72</td>
<td>3.01</td>
<td>5.00</td>
</tr>
</tbody>
</table>
Code Examples

Modeling:

A Simple, One Pool Dynamic Model in R
Repeatedly Simulating a Dynamic Model Using Different Inputs
A 3-Pool Dynamic Model
Least Cost Diet Formulation
Diet Formulation to Optimize Profit

Statistical Analyses:

Linear Regression
Nonlinear Regression
Analysis of Variance
Analysis of Covariance
General Linear Models
Mixed Models
Get started with R
Future - Goals and Direction

• Expanded opportunities with the website.
• More dynamic, current, and robust feedstuff data base.
• Expanded educational options through the website.
• Modeling workshops at societal meetings (ADSA, ASAS, PSA, ESS).
• Integrated animal performance databases with nutrient requirement estimates.
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