Participants in table discussions addressed five questions. The following is synopsis of their input:

**Question 1:** Addressing research into Alternative Feeds requires that all stakeholders (industry, government and academia) work together. In your table discussion please address the following: i. What are industry’s needs?; ii. Provide input on what the issues are today and what are tomorrow’s opportunities?; iii. How can industry, government and academia be more aligned?

SWOT type analysis of input received from participants – relative to Alternative Feeds

**Strengths/Successes**
- Great to see that LRIC is taking the lead to work on coordination; priority setting; using resources to reduce overlap; bringing all stakeholders from within and beyond Ontario – livestock species, service industry, product suppliers, researchers, etc.
- Dried Distillers Grain & Solubles (DDGS) has been very successful. It was needed and was adapted.
- Co-products from other industries can help push the agenda for alternative feeds, however, 1.) Other industries often have their own reasons/agendas, and 2.) Livestock industries need a consistent volume of supply;
- Having a theme would strengthen this initiative (production efficiency, cost of production, farm-to-fork, food safety, and traceability).

**Challenges/Weaknesses**
- Research focus to-date has been less practical/conducive to application in the field.
- A disconnect exists between academia/research and what industry can apply. Major disconnect between others and federal government.
- Resources are needed for extension and education of producers and consumers.
- How can there truly be collaboration on alternative feeds? (Between sectors – farmers/industry/researchers/government/consumers)
- Industry economics will drive development in alternative feeds but government regulations can slow the adoption of new technology in alternative feeds.
- With co-products there is a need to understand and characterize ingredients better (i.e. nutritional value, feed conversion equations).
- Can true alternatives such as insects be applied - regulations; trade. There must be transparency for the consumer (i.e. perception, acceptance).

**Opportunities**
- With an (LRIC) alternate feed initiative there could be: redistribution of funding to cover all levels (applied to basic); redistribution of:
Federal funding; greatly increased collaboration (all sectors including consumers); extension to a national approach including Center(s) of excellence.

Threats
• Fewer agriculture graduates than in the past and lack of replacements for graduates that move to other jobs. Less funding for graduate work in agriculture.
• University positions not being filled or implemented (for a variety of reasons)

Question 2: What are the areas that need to be studied in alternative feeds? Also assign priorities to the areas?

Open meeting general discussion brought forward an extensive list of topics that need to be addressed when setting up a plan for Alternate Feeds. The list was summarized to eleven areas as follows:

- Markets
- Energy/fractionation/genomics
- Protein/fractionation/genomics
- Co-products
- Insects and other unconventional sources
- Waste Management
- Forages
- Feed processing/technology development
- Feed additives/vaccines
- Feeds and animal health
- Feed and the environment

Each (of six) table discussed priorities for alternate feeds research. The organizers noted that the results from each table appeared to be influenced by the composition of the table groups. Each group was asked to identify the top four priorities (two tables went beyond four priorities and some tables’ grouped topics).

<table>
<thead>
<tr>
<th>Element</th>
<th>Table 1</th>
<th>Table 2</th>
<th>Table 3</th>
<th>Table 4</th>
<th>Table 5</th>
<th>Table 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed&amp;Animal&amp;HumanHealth</td>
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<td>2</td>
<td>3</td>
<td>1</td>
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<td></td>
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<td>Energy (incl fractionation)</td>
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<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein (incl fractionation)</td>
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<td>4</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed Processing</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
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<tr>
<td>Feed and the environment</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Co-products</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Food wastage/management</td>
<td>7</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-conventional(e.g. insects)</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
Meeting participants were given stickers to attach to individual sheets for the eleven topics. The results of the voting of the individual participants were;

<table>
<thead>
<tr>
<th>Element</th>
<th>Ranking</th>
</tr>
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<tbody>
<tr>
<td>Forages</td>
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<tr>
<td>Co-Products</td>
<td>24</td>
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<tr>
<td>Feed &amp; Animal Health</td>
<td>18</td>
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<tr>
<td>Markets</td>
<td>16</td>
</tr>
<tr>
<td>non-conventional (insects)</td>
<td>14</td>
</tr>
<tr>
<td>Feed processing and technology</td>
<td>14</td>
</tr>
<tr>
<td>Feeds and the environment</td>
<td>14</td>
</tr>
<tr>
<td>Protein/Fractionation/Genomics</td>
<td>13</td>
</tr>
<tr>
<td>Waste management</td>
<td>9</td>
</tr>
<tr>
<td>Energy/Fractionation/Genomics</td>
<td>9</td>
</tr>
<tr>
<td>Feed additives/vaccines</td>
<td>8</td>
</tr>
</tbody>
</table>

**Question 3:** Please discuss and provide examples of success in past work on alternative livestock feeds.

Each table was asked to identify areas where past research efforts have led to successful outcomes that have positively impacted livestock agriculture.

Past Successes:

**Products**
- Omega/DHA (milk, eggs & pork). [6x]
- Linkage of feedstuffs to meat quality

**Nutrition**
• Adoption to DDGS [5x]
• Nutrient flow model / net energy system [3x]
• Use of Distillers Grain – all livestock industries
• Soluble fibre – order control in swine
• Enzyme research (phytase) – reduced feed cost
• Lysozyme in egg whites
• Amino acid availability / Replacement Proteins (flax & canola)
• Nutrient bioavailability in feed
• Pre & Probiotics

**Disease/Health**
• Mycotoxins research
• Feed prion elimination

**Technology/systems**
• Liquid swine feeding [3x]
• Rotational grazing
• Swath/bale grazing in winter
• Rotational cropping to avoid disease build up in monoculture crops
• Environmental farm plan
• Systems analysis approaches in terms of interpreting research results and predicting the future
• Reduced feed cost per unit gain

**Other**
• Fatty acid composition in functional foods

**Question 4:** Please identify priorities for alternative feeds research and criteria for evaluating alternate feeds research proposals.

Each table focused on GAP Analysis for priorities relative to Alternate Feeds Research. The following is a summary of the input received.

1. **Criteria For Evaluating the Research**
   • Economics, Feasibility, Feed Conversion and Sustainability for the livestock industry
   • Net return/Return on Investment (ROI) of the (feeds) research
   • Anticipated chance of success and application of the research
   • Environmental Impact (for the industry & products)
   • Acceptability to Society
   • Integration/Collaboration/Team Effort towards goals
   • Vision/Innovation/Transparency
   • Communication and Technology Transfer Plan
   • Risk Assessment for the research and products
   • Limiting factors: Water or Greenhouse Gases (GHGs)
2. Domestic Priorities
   • Environmental Impact (for the industry & products)
   • Acceptability to Society
   • Plant breeding for cooler temperate climates, for feed processing
   • Granting of regulatory exemptions for research initiatives
   • Precision Agriculture in Canada (production, handling, processing)
   • A proper balance between basic and applied research
   • Waste management - blending of food by-products
   • Food safety, animal health
   • Market research – cost benefit for producers and also consumer acceptance

3. More Global Priorities
   • Ingredient characterization for alternate feeds (included bioavailability)
   • Benchmarking of additives and products
   • Need for a global feed evaluation system (online – diet formulation)
   • Basic research including macro & micro minerals, vitamins, digestibility, availability.
   • Plant breeding – low lignin legumes, NDF digestibility, plants resistant to mycotoxins.
   • Novel enzymes (i.e. cellulases)
   • Feed additives (including pre/probiotics, antibiotics)
   • Ingredient characterization – starch & fibre fermentable or digestible to use co-products effectively
   • Market research – is product exportable.

Question 5: This meeting has been a very good start. Do participants have additional thoughts, comments or suggestions?

Participants were informed of LRIC plans including reporting back to participants, use of an expert panel to prepare a white paper that will go forward to governments as a start to developing a research cluster / center of excellence. Participants were asked to self-identify if they wish to be considered for inclusion on the expert panel.

Participants provided comments including:

• Think beyond Ontario, even globally. Develop support for the concept of a research cluster.
• Provide participants and their organizations a report from the day
• Have a well thought out communication plan, and a collaborative approach
• Cover the entire range from production to consumption
• The public will become more aware and demanding of the food they consume