SUSTAINABLE ANIMAL NUTRITION

WELCOME ADDRESS: Prorector/Director
L. PINOTTI “A tread off between SusFEED & SUN projets”
M.C. RULLI “On the production of environmentally sustainable feed”
R. ČOLOVIĆ “Utilization of inedible by products from Serbian food industry for sustainable animal nutrition”
V. MASSA “The industrial point of view: the case of FFPs”
M. CASTRICA “Innovative Start UP : FeedFromFood Solution “(Spin-Off UNIMI)
M. OTTOBONI “Insect potential in upgrading food waste streams to feed”
M. ROSSATI Funzionario VI Commissione Consigliare Ambiente Regione Lombardia (da confermare)
Sustainable Animal Nutrition

“A tread off between SusFEED & SUN projects”
More than 80% of farmland is used for livestock but it produces just 18% of food calories and 37% of protein.
Hearing BAD things about livestock these days?
Get the FULL story.

https://youtu.be/ot0oBb3dzy4

@GALivestock
## Production efficiency trend

*(kg feed per kg of animal product)*

<table>
<thead>
<tr>
<th>Product</th>
<th>1960-1970 FRC</th>
<th>Today FCR</th>
<th>Efficiency improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry meat</td>
<td>4,5</td>
<td>1,9</td>
<td>57%</td>
</tr>
<tr>
<td>Turkey meat</td>
<td>6,0</td>
<td>2,5</td>
<td>58%</td>
</tr>
<tr>
<td>Eggs</td>
<td>4,3</td>
<td>2,1</td>
<td>51%</td>
</tr>
<tr>
<td>Milk</td>
<td>2,2</td>
<td>0,7</td>
<td>68%</td>
</tr>
<tr>
<td>Pig (100 kg) meat</td>
<td>4,3</td>
<td>2,7</td>
<td>37%</td>
</tr>
<tr>
<td>Beef (400-700 kg)</td>
<td>9</td>
<td>7</td>
<td>22%</td>
</tr>
<tr>
<td>Mean</td>
<td>5.05</td>
<td>2.81</td>
<td>49%</td>
</tr>
</tbody>
</table>
Do more with less!

**LIVESTOCK SUSTAINABILITY:**
50 Years of Improving Efficiency

One kilogram of eggs produced in 2010 generated 70% fewer greenhouse gas emissions than in 1960 due to more efficient production.

Better nutrition, medicines and husbandry have increased efficiency of U.S. beef production by 30% since 1977.

In 1944, a US dairy cow produced 2,000 liters of milk each year. In 2007, due to improvements in genetics and health, dairy cows produced more than 9,000 liters per year.
IMPROVING SUSTAINABILITY IN LIVESTOCK PRODUCTION

- More efficient animal nutrition (feed conversion rates)
- Minimization of food losses
  - use of by-co-products
  - Looking for new sources of feed materials other than «classical feed materials»
Nutritional evaluation of former food products (ex-food) intended for pig nutrition

C. Giromini, M. Ottoboni, M. Tretola, D. Marchis, D. Gottardo, V. Caprarulo, A. Baldi and L. Pinotti

*Department of Health, Animal Science and Food Safety, University of Milan, Milan, Italy; †Cire.A.A. – National Reference Centre for the Surveillance and Monitoring of Animal Feed, c/o Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d’Aosta, Turin, Italy

Gravimetric quantitative determination of packaging residues in feed from former food

Giuseppina Amato, Rosanna Desilvestro, Tiziana Giovannini, Luciano Pinotti, Marco Tretola, Martina Gili & Daniela Marchis

Pages 1446-1468 | Received 02 Feb 2017, Accepted 29 May 2017, Accepted author version posted online: 05 Jun 2017, Published online: 28 Jun 2017

Review: Insects and former foodstuffs for upgrading food waste biomasses/streams to feed ingredients for farm animals

L. Pinotti†, C. Giromini, M. Ottoboni, M. Tretola and D. Marchis

†Department of Health, Animal Science and Food Safety, University of Milan, Milan 20134, Italy; ‡Istituto Zooprofilattico Sperimentale del Piemonte, Liguria e Valle d’Aosta, Turin, Italy

Former food products safety: microbiological quality and computer vision evaluation of packaging remnants contamination


Pages 1427-1431 | Received 31 Jan 2017, Accepted 26 Apr 2017, Accepted author version posted online: 17 May 2017, Published online: 25 Aug 2017

Former Food Products Safety Evaluation: Computer Vision as an Innovative Approach for the Packaging Remnants Detection

Marco Tretola, Matteo Ottoboni, Ambra Rita Di Rosa, Carlotta Giromini, Eleonora Fusi, Raffaella Rebbuci, Francesco Leone, Vittorio Dell’Orto, Vincenzo Chiofalo and Luciano Pinotti
What are FORMER FOODSTUFFS PRODUCTS?

FFPs are circularly economy animal feed ingredients composed by processed and ready-to-eat food products, no longer suitable for human consumption due to logistical, manufacturing or packaging defects.

- FFPs have shown a nutrient composition comparable with cereal grains.
- FFPs are characterized by a relative high energy and starch/sugar content, and a valuable amount of fat.
- FFPs are a fat-fortified version of common cereals used as energy ingredients in farm animal nutrition.
PARTNERS of the projects

SusFEED

SUN
**SUSTAINABLE FEED DESIGN APPLYING CIRCULAR ECONOMY PRINCIPLES: THE CASE FORMER FOOD IN PIG NUTRITION**

- **FFPs ingredients will divided in two categories:**
  - leftover of the food industry mainly composed by *bakery products* (i.e. bread, pasta, etc.)
  - leftover of the food industry principally composed by *confectionery products* (e.g. chocolates, biscuits, etc.)
- **Sustainability assessment**
  - Provide new data on environmental sustainability evaluation and LCAs
  - Contribute to the calculation of the environmental footprint of compound feed production
GRANDE RILEVANZA
AGRICULTURE AND FOOD TECHNOLOGY:
SUSTAINABLE ANIMAL NUTRITION

- Use new and alternative feed ingredients as an interesting alternative protein/energy sources for animal diets

- Continue and implement the collaboration that has been started in the “FEEDNEEDS” project, where FINS and VESPA have been involved in the 2015-2016
AIM PROJECT

• Investigate the production and use of by/co-products, new and alternative feed ingredients in designing a sustainable animal nutrition

• All groups will explore the production of by/co-products, new and alternative feed ingredients in the territory in which they are embedded, and will guarantee safety of the feed ingredients

• **ITALY** is one of countries with the biggest FFPs potential in Europe.
• **SERBIA** is an important producer of agricultural commodities in Central Europe.

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**1st year**
- To get a picture of by/co-products, new and alternative feed ingredients produced both countries
- To study some representative process

**2nd year**
- To define same key best practice in by/co-products, new and alternative feed ingredients
- To assess the safety of alternative feed ingredients in terms of mycotoxin contamination
LIVESTOCK AND SUSTAINABILITY

AN ESTIMATED
ONE THIRD
OF THE WORLD’S
CEREAL HARVEST
IS FED TO FARMED
ANIMALS.

That would be enough
grain to feed about
3 billion people.

Animals
Australia
the voice for animals

SOYBEANS ARE...
80% MEAL
The primary component of soybeans is meal.
20% OIL
The other soybean component is oil.

97% ANIMAL FEED
92% of soybean oil is used to fry
and make food, and soybean oil
and soy protein isolate are used
in animal feed. The remaining 8% are
used in food products like
bread, poultry, and livestock.

58% FOOD
58% of soybean oil is consumed as
a food product, including
soy-based sauces and
dressings, and

3% FOOD PRODUCTS
3% of soybean oil is
used in food products like
soy-based sauces and
dressings.

7% INDUSTRIAL USES
7% of soybean oil is
used in industrial
applications, such as
biodiesel and

20% BIODIESEL & BIOELECTRICITY
20% of soybeans are
used for biodiesel and
bioelectricity.
10 Kg Feed

- 9 Kg
- 1 Kg

- Grasshoppers:
  - 72% Protein
  - 12% Carbs
  - 16% Fat
  - 96 kcal per portion

- Beef Mince:
  - 52% Protein
  - 48% Fat
  - 285 kcal per portion
Thank you for your attention!