An Overview of Silage Production and Utilization in Brazil
(With focus on current practices)

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The University of Lavras

With the support of numerous cattle producers across Brazil
Outline

1. Introduction
2. Crops for silage production
3. Storage systems
4. Harvesting and forage harvesters
5. Filling and packing
6. Covering
7. Unloading
8. Additives
9. Microbial status and mycotoxins
10. Nutritive value
Milk production - Brazil # 4

Milk production (1,000 Metric Tons)

US, India, China, Brazil, Russia

USDA, 2015
Beef production - Brazil # 2

1,000 Tons Carcass Weight Equivalent

US
Brazil
EU
China

USDA, 2015
The basic diet of cattle primarily consists of grazing

- Areas for pastures
- Different species for grazing
The importance of forage conservation in Brazil

• Dry season and pasture shortage
• Intensive systems
Hay making is less common

1. Weather conditions;
2. Tropical grasses have more resistance to moisture loss;
3. This activity needs more equipments.
Silage making is main method
How are Brazilian farmers producing silage?
Survey on current silage management practices

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Study on the practices of silage production and utilization on Brazilian dairy farms

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2. Crops for silage production

Corn and sorghum are the two most common forages in the diet. Brazil has grown around 2 million hectare of corn for silage.
2. Crops for silage production

- High DM yield (~50 ton/ha)
- High WSC
- Moderate nutritive value (NDF=50%)
- Specific forage harvesters
- Susceptible to ethanol fermentation
3. How is silage stored?

- Brazilian farmers prefer trench, bunker or drive-over pile
- Pressed-bag and round bale are often associates with another type of storage
4. Forage harvesters

Delivery rate
(time to fill the silo)
4. Forage harvesters
5. Filling

Over-filled
Yeast counts at the top of corn silage on 32 dairy farms

De Oliveira et al. (unpublished data)
6. Covering

Black plastic increases DM losses (Bernardes et al., 2009; Muck, 2011)

White polyethylene (black underside)
6. Covering – Adoption of new technologies
7. Unloading and Face Management
7. Unloading and Face Management

Removal of the face
7. Unloading and Face Management

Removal of the face on high-input farms

Graph showing the percentage of farms with entire and half farms.
7. Unloading and Face Management

Feed-out rate on high-input farms

- ≤ 30 cm
- 31-59 cm
- ≥60 cm
8. Additives

Do you apply additives?

![Bar chart showing percentage of farms that apply additives.](chart.png)
## 9. Microbial status and mycotoxins

### Mycotoxin incidence in corn silage on 109 dairy farms

<table>
<thead>
<tr>
<th>Mycotoxin</th>
<th>Incidence (%)</th>
<th>Mean (ppb/kg DM)</th>
<th>Tolerated level (ppb/kg DM)</th>
<th>Concentration over TL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zearalenone</td>
<td>72.8</td>
<td>181</td>
<td>285</td>
<td>10.1</td>
</tr>
<tr>
<td>Fumonisin B1</td>
<td>48.6</td>
<td>369</td>
<td>1,000</td>
<td>4.6</td>
</tr>
<tr>
<td>Deoxynivalenol</td>
<td>33.6</td>
<td>259</td>
<td>930</td>
<td>0</td>
</tr>
<tr>
<td>Fumonisin B2</td>
<td>25.1</td>
<td>261</td>
<td>1,000</td>
<td>4.6</td>
</tr>
<tr>
<td>Ochratoxin A</td>
<td>6.1</td>
<td>11</td>
<td>5</td>
<td>4.3</td>
</tr>
<tr>
<td>Aflatoxin B1</td>
<td>0.9</td>
<td>3</td>
<td>19</td>
<td>0</td>
</tr>
</tbody>
</table>

Schmidt et al. (2015)
Nutritive value of corn silage samples (from top and core) analyzed at the Forage Laboratory, University of Lavras
Final Remarks

The following priorities should be considered:

• Lines of credit and cooperatives to increase the purchasing power of smallholders
• Programs to increase the knowledge of farmers and extension workers

Priorities for the future:

• Influence of silage making on food safety (milk)
• Impacts of silage making on the environment
Thank you for your attention!