KOSOVO

CLUSTER AND BUSINESS SUPPORT PROJECT

Forages and Dairy Cattle

Contract #AFP-I-00-03-00030-00, TO# 800

Submitted to:
USAID/Kosovo
Cognizant Technical Officer: Timothy Hammann

Prepared by:
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Submitted by:
Chemonics International Inc.

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Key Findings

No farmer surveyed in Kosovo was cutting alfalfa or grass at the proper time. The average result in lost of protein and carbohydrates for the diary cow was over 50%. If the farmer cut the grass or alfalfa three days to a week earlier, at no cost, his dairy cows could double their milk production (given all other management are done properly). Further, the farmer could get an extra cutting during the year.

Silage preparation was being done incorrectly on all farms surveyed. The farmers are taking too long to fill the bunker resulting in too much oxygen thus spoiling the silage. The farmers were taking up to a week to fill the bunker when it should be done in no longer than 2 days.

The corn and grass was being cut to long, therefore, not allowing for proper density of packing the silage. The silage was being cut in over 10 centimeter length when it should be cut in no more than 5 centimeter lengths.

The covering over the silage was not being properly sealed, therefore, allowing for water and air to spoil the silage. The corn was being harvested too late, therefore having too much roughage and less protein and carbohydrates than optimal. The consultant showed the farmers no cost methods of dealing with all of these problems.

Red Clover was identified as an ideal rotation crop to grow in Kosovo. It can be grown to full harvest in one season. Provides great yields in this climate and conditions. It is a legume that fixes the nitrogen in the soil thus allowing corn to be grown the next year without adding nitrogen fertilizer. It is drought tolerant for the Kosovo late summers. It is higher in protein than most alternative crops being grown in Kosovo.

All recommendations were discussed with groups of farmers and many of the improvements were being implemented by the farmers prior to my leaving.

All needed follow up was discussed with KCBS and they are developing appropriate programs to implemented recommendations. See following for recommendations.
Recommendations

The following activities are recommended to produce profitable returns to farmers in short time:

1) Encourage earlier harvest of grasses and legumes (for either hay or silage).
   a. Sample some fields of alfalfa and grasses at different stages of maturity and analyze for forage quality.
   b. Have analysis run by Dr. Ragip Kastrati from the Animal Nutrition Section of the University of Pristina.
   c. Contract for forage quality testing being developed by KCBS
   d. Brochure in Albanian and Serbian being developed.

2) Encourage harvesting maize at proper stage for silage
   a. Brochure for maize preparation was developed in English being made for farmers by KCBS

3) Encourage making plastic wrapped bales (baleage) for making silage of grasses and legumes.
   a. Look for local producer of plastic in region
   b. Arrange purchase of baler and wrapper
   c. KCBS is preparing a seminar for the KODA board to identify proper silage making equipment

4) Look for opportunities for group purchase of grass and legume silage making equipment through cooperatives

5) Do test plots of Red Clover
   a. Fall planting
   b. Spring Planting
   c. Cover crop in grazing area
   d. KCBS is getting the seeds from various seed providers for the fall and spring test plots

6) Focus on proper silage making
   a. Collect some samples from bunker silos of maize silage.
      i. KCBS is setting up agreement Dr. Ragip Kastrati from the Animal Nutrition Section of the University of Pristina to do analysis
      ii. Student of Dr. Imer Rusinovci will collect sample and assistant of Ragip.
         1. Analyze samples for pH
         2. Collect silage density data from bunkers
Field Visits and Seminars

Tuesday (May 17, 2005)

Visited farm in Eurolona. The farmer had 120 ha for 13 cattle. He was farming land of several relatives who had not returned since the war. He had plenty of good quality hay from pasture. He wants to calve in fall to produce winter milk which pays at higher rate than summer milk. Low pasture forage density would limit milk yield of dairy cows, though not an issue for this farmer as most of his cows are calving in the fall. He had planted oats which I recommend harvesting at boot stage. He used a very high seeding rate for oats (300 kg/ha). I talked with agronomists who would recommend about 100 to 200 kilos seeding rate (US seeding rate is 60 kg/ha,). At €20 per 100 kg, costs could be saved by lowering seeding rate. He had a good stand and probably needed higher rate because of poor seeding equipment. Perhaps rental or shared equipment would be helpful. Talked about making haylage in a bunker from pasture. He will not be able to chop which will make lack of packing an issue. The unchopped fermented silage would also be difficult to feed out of the bunker.

Wednesday (May 18, 2005)

We visited large farm (“Premium Vet”) near Zahaq operated in partnership by Qerim Halilas and Fadil Sadikas. They were feeding green chop which was much too mature. Maize silage they were feeding was made too mature and not packed properly. They were scraping silage off the face of the silage into a pile and feeding from that for 3 to 4 days. I recommended against this because the loosened silage in the pile began to mold and that remaining by the end of the 3rd and 4th days was moldy. We looked at a grass field that was headed out. It is too mature for good dairy feed though it had clover in it. They want to bale and wrap as silage. This could work but low starch and sugars due to maturity will make this more difficult. We looked at the alfalfa. It was at bud stage and should be harvested right now. They were still planting maize because spring had been too wet to start on time. I recommended stop that they planting maize and harvest alfalfa. They have plenty of forage so loss of some tonnage of grain or maize silage is less of an issue than the need for quality forage which will be lost if harvest is delayed. We discussed that fiber of alfalfa increases at rate of 0.5% per day.

We visited the farm of Sokol Mula. Forage was harvested too late and recommendations were made for earlier harvest.

Visited farm of Dvragjin Deda (in Peja region). Cows were in very good condition. Excellent maize silage, put up at proper stage so kernels not too hard. Silage was chopped to about 0.8 cm (slightly shorter than necessary) and packed well. He had farmer from first paragraph do chopping who brought a chopper with a 4-row header and chopped and filled bunker silo in less than 2 days. We visited barley and cowpeas field, I recommended harvested when barley in boot stage. New alfalfa seeding was just emerging.

Thursday (May 19, 2005)

We returned to Dvragjin Deda farm in Peja Region to give seminar. Nine farmers were present for Jim’s talk on fertility. I took the farmers to the bunker of maize silage and discussed silage making. This is excellent silage and I used is as an
example of what good maize silage should look like. We recommend no additives (many add salt or purchase inoculants from Northern Europe). We went to field and examined and discussed cowpeas with mixture of wheat and barley. I recommended harvesting now when small grain was at the boot stage. There were many questions about alfalfa. We discussed when to harvest for silage (bud stage). There was significant interest in making wrapped bales. The issues are availability of machine and cost of plastic.

Friday (May 20, 2005)

We went to Agricultural High School at Lypjan and met with agricultural faculty. We toured their machinery, recommended harvesting alfalfa and grass two weeks ago for dairy, and discussed their facilities and effort. I gave a presentation to faculty and students on silage making. About 28 people were present. I stressed harvesting on time, packing well, and silage feedout methods. We had excellent questions. They had a field I was asked about harvesting that should have been harvested at least 10 days previous.

Monday (May 23, 2005)

We went to the Dushkaja region and gave a presentation on silage making to about 40 farmers of the Dushkala Bec’Gjakovë Association. There were good questions and interest in making silage. Dr. Ragip Kastrati from the Animal Nutrition Section of the University of Pristina was present. He agreed with the material presented, supporting many comments and added further comments.

We visited the Ramush Tafa Dairy farm. He had made some round bales of grass silage the cattle would not eat. The baleage had been made with the forage was too mature, it had been harvested too dry for good fermentation and had been wrapped with only 1 layer of plastic so that oxygen had penetrated plastic and caused spoilage. We opened a bale and found white mold on the surface of the bale as I had predicted due to oxygen diffusion through the plastic. Little fermentation had occurred. We also examined some of his maize silage. It was harvested too late and had whole maize kernels. The farmer said he saw maize kernels in the cow manure which I indicated meant that energy had been lost. The maize was chopped too long and insufficiently packed so that fermentation was poor.

Tuesday (May 24, 2005)

I gave presentation as part of a symposium to KAMP. Approximately 37 people were present. The audience was attentive, interested and asked good questions.

Visited with Astrit Shabani from Agroprodukt Commerce about the potential for his company manufacturing plastic for wrapping bales. We discussed the potential for 3 to 5µ thickness, opaque film for wrapping bales, with 50% stretch and UV inhibitors. He suggested that he needed a sample of what we use to have the best idea of how to manufacture the plastic. I will send Milazim a sample to forward to Astrit.

Also visited with Dr. Sc. Imer Rusinovci. He is professor at the University and DPPP director for Provisional Ministry of Agriculture, Forestry and Rural Development. He is interested in doing some joint research. We talked about doing some research on maize silage plant populations and some other potential future collaborative research.
**Wednesday (May 25, 2005)**

Visited a farmer (Bajrush Mujota) who was growing grass hay for sale. The field we inspected was not going to be harvested for some time. The farmer had applied 100 to 150 kg/ha of 15-15-15. This is probably okay for the phosphorus and potassium but lacking for the nitrogen. We discussed how an additional 30 kg/ha of nitrogen should have been applied as urea. We visited a small site where manure had been stored. The grass was twice as tall as the rest of the field and very thick. Yield was clearly 3 to 4 times that of the rest of the field. We mentioned that the whole field should look like that.

We discussed the need to sell hay based on quality as well as tonnage to produce quality hay for the dairymen as well as give a profit to the hay grower. Later maturity forage yields more so there is an advantage to the seller to harvest low quality, later maturity if hay is sold on a tonnage basis. The dairymen needs quality hay so he wants it harvested at early maturity. In the Midwest US mature grass hay sells for about $40 per ton. High quality dairy hay sells for $100 to $120 per ton. This higher price provides the incentive for hay growers to harvest the quality that produces more milk.

This farmer also had an arrangement to take one cutting off of the entire 8 hectares (two of which he did not own) and let the owner of the 2 hectares graze the entire 8 ha the rest of the season. We discussed how, if he cut earlier and applied fertilizer in early spring and after first cutting, he could get two cutting and then turn the field over to the farmer for grazing by July 1. This might still be acceptable to the grazing farmer since grazing is usually most lacking late in the season. We also discussed the benefits of seeding red clover into the field.

We visited the Aruq Krasniqi Rudina Dairy Farm in Prizren. He showed us a harvested field of red clover and grass. He mentioned that the clover was a thin stand. I suggested drilling 4 kg/ha of red clover into the field next April 1. He was seeding mostly annual forage crops because he did not own the land. He had some excellent hay/silage crop fields of common vetch (Vicia sativa) mixed with oats. He was seeding this at the rate of 200 kg/ha and complaining about the price. I believe the demonstration plots are seeded at the rate of 100 kg/ha (typical seeding rate in the US is about 30 kg/ha). We should use these demonstration plots as a teaching tool to help farmers save money by encouraging lower seeding rates.

We met with the Faruk Beqa, director of Agriculture Department for Province of Shkime, and visited a dairy farm operated by two brothers. Their maize was up and about 10 cm tall. Agropyron repens and several broadleaf weeds were also growing and the field was badly in need of herbicide. We visited their hayfield which was common grass with some invaded clover. It was lacking in fertilizer and should have been harvested two weeks ago. They harvest once and then graze for the summer. Investigation should be made to harvest twice (with timely harvests) and then graze a remainder of the season. They were out of silage so this system might help that problem.

**Thursday (May 26, 2005)**

We visited demonstration plots, joint with Kodaa, at Podujevo for variety test/demonstrations of maize, sunflower, soybeans and alfalfa. The maize, soybeans and sunflower were emerged and looked free of weeds. I recommended that areas of uniform plant population be staked and plant counts be taken by counting plants in staked areas to be harvested. Four strips at least 3 meters long should be taken
within each variety. This should be done as soon as possible because corn will get too tall and soybeans too bushy to easily determine plant density. In the future, care should be taken to know seeds planted per acre and then differences in emergence of each variety/hybrid can be measured.

The alfalfa plots were weedy. The field had been in potatoes last year and some potatoes were emerging. They were 10 to 15 cm tall and too big for herbicide. I recommended waiting couple weeks and mowing field above height of alfalfa to remove the potatoes. I was concerned about the numerous broad leaf weeds that were emerging and suggested watching and possibly spraying in about 10 days when alfalfa has reached the 4-leaf stage if alfalfa was not taller than the weeds.

Approximately 22 people were present. Three were from the municipality, including the director of Agriculture. We had a long discussion about stage for cutting hay and silage. He wanted more silage made but was not familiar with techniques for making it and we had a long discussion on that.

The farmer, hosting the test site, had a field of alfalfa at the bud stage that we recommended harvesting. He had another field of alfalfa and Lolium. The alfalfa was at bud stage and the grass at boot stage so we also recommended cutting it.

We visited a nearby farm and viewed his fields. Alfalfa was at the bud stage and ready to harvest. We went to his bunker silo and viewed his corn silage. It was well made, being harvested at the proper stage and packed well. He had significant storage losses because there was a slope from the top of the silage in the middle to the cement wall of the bunker. Water ran off the plastic on the silage surface to the edge, collected there and ran down into the silage. Losses appeared to be nearly 30%. I recommended not ending the plastic at the bunker wall but rather to have plastic some distance up the wall.

He wanted to make alfalfa silage. I recommend the following steps:
1) cut now at bud stage
2) let wilt for 24 hours
3) chop to length of 15 cm or (preferably) less
4) spread alfalfa in 10 cm deep layers in bunker
5) pack with tractor for 5 min per ton of silage
6) fill silo within 2 days
7) cover and let ferment 3 weeks before feeding

Friday May 27, 2005

We went to the school at Leshak. We visited with the director, Ilica Mihajlovic. With his leadership, they are establishing a practical farm and will be making silage. We toured the farm. The farm has chickens, hogs, and 10 dairy cows (Semimetal). We had a talk to the faculty on silage making. The process is not common in the region but there was interest in the topic and some felt a future. We discussed the economics of various options. I am not sure that there is much future for silage in the region due to small farms and dependence on grass pasture. I do recommend putting out some plots with the director. He wants to try some corn silage hybrids and some sudangrass. I suggested including some brown midrib sudangrass types for higher digestibility.
Saturday (May 28, 2005)

We visited the test plots, joint with Kodaa, at Screndervaj. The alfalfa had Agropyron repens (quack grass), bindweed, and several other weeds. Plots will be sprayed soon but it is unlikely that much can be done about the quack grass. The corn, soybean, and sunflower plots had disuniform plant spacings. I recommend locating portions of the field with uniform plant populations, counting plants and staking to mark at the site to harvest. This would be much easier to do now than when crops are taller.

Fourteen students from Pristina Agricultural College came along and Dr. Imer and I talked to them about establishing alfalfa and corn and about when to harvest and how to make silage.
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Forages and Dairy Cattle

Annexes

The Silage Making Process – a Powerpoint presentation
Making Good Silage
Producing Quality Forage
Harvest Forage at Proper Stage
Basic Principles of Grazing
KAMP Brochure for Forage Improvement
The Silage Making Process

Dr. Dan Undersander
University of Wisconsin
Harvest and Preservation Expectations

From the moment the crop is cut until it is fed to the animal, biological and mechanical changes occur that decrease quantity and nutritional quality of feed.

**Goal:** Conserve the protein and energy in the forage and to maintain protein in a form that can be effectively utilized by the ruminant.
Effects of forage moisture content on various microorganisms and processes in forage.
Moisture influences microorganisms and plant processes

- Yeasts and molds degrade forage in the presence of oxygen
- Lactic acid bacteria (LAB) and clostridia grow without oxygen-LAB are beneficial
clostridia are detrimental
- Plant enzymes solubilize plant proteins
- Browning reaction is a chemical reaction caused by high temperatures
Making good silage

- Harvest at correct crop stage
- Forage quality declines
  - Forage quality declines with advancing maturity in grasses and legumes
    - Harvest grasses when head is in leaf whorl
    - Harvest legumes at bud stage
    - Harvest corn at half milk line
  - Kernels of corn become hard and unavailable to cow
Effect of Alfalfa Maturity on Forage Intake by Dairy Cattle

Intake (kg/day)

Prebloom  Early bloom  Mid bloom

23        22        21

17        18        19
Effect of Forage Quality on Milk Production at Four Concentrate Levels

Milk Production (kg/day)

- 20% concentrate
- 37% Concentrate
- 54% Concentrate

Alfalfa Maturity

Prebloom, Early bloom, Mid bloom, Full bloom
Dry Matter Losses during Harvest and Storage when Forage is Harvested at Varying Moisture Contents

- **Loss (% of DM)**
  - Harvest Loss
  - Storage Loss

<table>
<thead>
<tr>
<th>Moisture content when harvested (%)</th>
<th>Loss of DM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
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<tr>
<td>30</td>
<td>15</td>
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<td>40</td>
<td>20</td>
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<td>50</td>
<td>25</td>
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<tr>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>70</td>
<td>35</td>
</tr>
<tr>
<td>80</td>
<td>40</td>
</tr>
</tbody>
</table>

- **Process Types**
  - Dry Hay
  - Treated/Wrapped Hay
  - Wrapped Bales
  - Wilted Silage
  - Direct Cut
Fundamental Strategy in Preservation of Silage

- Exclude oxygen from silage mass, and reduce the pH rapidly through bacterial fermentation.
Challenges for making good silage

- Minimize respiration losses
- Lactic acid fermentation requirements
- Provide sufficient Lactic Acid Bacteria
- Minimize protein solubility (alfalfa)
Challenges for making good silage

- **Minimize respiration losses**
- Lactic acid fermentation requires:
  - Sufficient plant sugars
  - Lactic acid bacteria on forage
  - Anaerobic conditions
  - Proper dry matter content
Principles of Ensiling

1. Aerobic Phase
2. Lag Phase
3. Fermentation Phase
4. Stable Phase
5. Feedout Phase
Phases of fermentation process

- Days:
  - 0
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12
  - 13
  - 14
  - 15
  - 16
  - 17
  - 18
  - 19
  - 20
  - 21

- Oxygen
- pH
- Bacteria

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Phases of fermentation process

Aerobic
Shortening Aerobic Phase

- Harvest at correct moisture (60 to 65%)
- Chop short
  - Chop short (75% less than 1 cm, 20% longer than 3 cm), kernels broken
- Fill/wrap rapidly
  - Recommend 2 days or less
  - Wrap within 24 hours
- Pack well
Making good silage

- Pack well
  - Bunker 4 to 5 minutes per ton with 5800 kg tractor in 12 cm layers
  - Pack bunker in flat sections or pack bunker in progressive wedge
  - Minimize heating

Progressive Wedge Technique
Shortening Lag Phase

- Harvest at correct moisture (60 to 65%)
- Fill/wrap rapidly
  - Recommend 2 days or less
  - Wrap within 24 hours
- Pack well
- Wrap with 6 layers of plastic/cover quickly
Rapid Decline in pH Needed . . .

- Reduce activity of proteolytic enzymes.
- Stops growth of other anaerobic bacteria (Enterobacteria, Clostridia, Listeria)
- Increase breakdown rate of polysaccharides. (Hemicellulose)
Remove Haylage Rapidly Enough to Prevent Losses

- Summer
  Remove 6 inches per Day

- Winter
  Remove 2 inches per Day

- Calculate Feeding Rates
Making Good Silage

- Harvest at correct crop stage
- Correct moisture for ensiling
- Minimize field losses
- Minimize oxygen in silo
- Manage feed out to minimize losses
### Dry matter loss as influenced by silage density

<table>
<thead>
<tr>
<th>Silage Density (kg of DM/m³)</th>
<th>DM loss at 180 days (% of the DM ensiled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>20.2</td>
</tr>
<tr>
<td>225</td>
<td>16.8</td>
</tr>
<tr>
<td>255</td>
<td>15.1</td>
</tr>
<tr>
<td>290</td>
<td>13.4</td>
</tr>
<tr>
<td>350</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Adapted from Rupple (1992).
Management Practices to Minimize Respiration Losses in Silage

Bunker Silo

Chop at correct TLC\(^1\)
Fill rapidly
Compress forage with tractor during filling
Cover with plastic, seal ends and sides carefully
Seal cracks in wall, repair holes in plastic cover

\(^1\)TLC = \text{theoretical length of cut. Chop haycrop silage at 3/8 inch TLC, corn silage at 1/4 inch TLC.}
Management Practices to Minimize Respiration Losses in Silage

Big Round Bale
- Bale tightly
- Wrap or seal carefully
- Repair damaged bags
In Line wrappers

Features:
- Bales end-to-end
- Less labor for wrapping
- Lower plastic cost (1/2 or less)
Mold on wrapped bales
## Estimated Losses in Corn Silage Storage Systems

<table>
<thead>
<tr>
<th>Source of dry matter loss</th>
<th>Horizontal trench or stack</th>
<th>Horizontal bunker</th>
<th>Bag</th>
<th>Round Bale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiration and weathering</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Harvesting</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Storage</td>
<td>15</td>
<td>12</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>(10-15)</td>
<td>(5-9)</td>
<td></td>
<td>(10-25)</td>
</tr>
<tr>
<td>Feedout</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25%</strong></td>
<td><strong>22%</strong></td>
<td><strong>17%</strong></td>
<td><strong>30%</strong></td>
</tr>
</tbody>
</table>

Making Good Silage

- Harvest at correct crop stage
- Correct moisture for ensiling
- Minimize field losses
- Minimize oxygen in silo
- Manage feed out to minimize losses
Making Good Silage

By Dr. Dan Undersander
University of Wisconsin

- Good management reduces field losses (can be up to 30% for grasses/legumes)
- Good management reduces storage losses (can be up to 30%)
- Good management means more milk per ton of silage

1) Harvest at correct crop stage
   a. Forage quality declines
      i. Forage quality declines with advancing maturity in grasses and legumes
      ii. Kernels of corn become hard and unavailable to cow

2) Correct moisture for ensiling
   a. If too high → seepage, souring, low animal intake
   b. If too low → molds, low digestibility

3) Minimize field losses

4) Minimize oxygen in silo
   a. Chop short (75% less than 1 cm, 20% longer than 3 cm), kernels broken
      i. Good compaction
      ii. Lactic acid bacterial to use sugars
      iii. Some long pieces for rumination
   b. Fill fast
      i. Silage exposed to air no more than 4 days
   c. Pack well
      i. Bunker 4 to 5 minutes per ton with 5800 kg tractor in 12 cm layers
      ii. Pack bunker in flat sections or pack bunker in progressive wedge
      iii. Minimize heating
   d. Seal to keep airtight

5) Manage feed out to minimize losses
   a. Keep silage covered
   b. Keep edge straight, no piles kept to next feeding
Producing Quality Forage

Dr. Dan Undersander
University of Wisconsin

1) The goal is to produce forage with as much energy and protein as possible.
2) Protein and energy decrease in grasses and legumes as maturity increases.
3) Fiber increases in grasses and legumes as maturity increases. The high fiber can reduce intake of both forage and concentrates in the diet and result in less milk production.

![Effect of Maturity Stage on Fiber and Protein Content of grass]

4) Cutting grasses at the boot stage (head almost emerged) and legumes at the bud stage optimizes forage yield and quality for milking dairy cows.
5) Legumes have lower fiber than grasses and therefore higher intake.
6) Silages (grass, alfalfa, clovers, and corn silage) should be put in silo or haylage bale at 65% moisture.
7) All silages should be packed carefully in the silo or bale and covered to exclude oxygen.
8) Grasses and legumes need nutrients to grow.
   a. Both need about the same phosphorus (about 60 kg/ha annually)
   b. Grasses need about 40 kg/ha nitrogen per cutting
   c. Legumes need about 25 kg/ha potassium per ton of hay produced. (12 to 15% moisture)
9) Phosphorus and potassium can be applied once annually (preferably after first cutting).
10) Nitrogen should be applied to the grass after each cutting.
11) Nutrients can be applied to field either as manure or commercial fertilizer.
Harvest forage at proper stage to get the most milk from cows.

Dr. Dan Undersander
University of Wisconsin

Harvesting grasses

Kg milk from ton of forage*: at head emergence – 1330 kg
at late heading 625 kg

Harvest grasses when heads are just beginning to emerge from top leaf.

Harvesting Alfalfa

Kg milk from ton of forage*: at bud stage – 1450 kg
at late heading 900 kg

Harvest alfalfa when buds are formed but no flowers.

* Milk production from forage when fed to a dairy cow with body condition score of 2 or better in during first 6 months of lactation.
Basic Principles of grazing - Animal Considerations

A) Animal nutrient needs

Forage quality needs of cattle

- Dairy, 1st trimester
- Dairy, last 200 days
- Heifer, 3-12 month
- Stocker cattle
- Heifer, 12-18 mo
- Beef cow & calf
- Heifer, 18-24 mo
- Dry cow

Forage quality needs of animals

- Stocker cattle
- Nursing more
- Hardworking horse
- Beef cow & calf
- Ewe with lamb
- Dry cow
- Ewe not lactating
- Lote tame

B) Animals graze selectively

Prefer higher quality forage
Eat favorite forages, generally grasses before legumes
Eat where forage is more lush

C) Animals graze fixed period of time

1. Importance of forage allowance/ of forage density
   - animals eat at a fixed rate (bites per minute) and for a fixed time (minutes per day)
   - only way farmer can influence animal intake is to offer more forage (t/ha).
   Can offer more by both forage height and forage density

<table>
<thead>
<tr>
<th>Forage per bite</th>
<th>X</th>
<th>Bites Per Minute</th>
<th>X</th>
<th>Minutes per Day</th>
<th>=</th>
<th>Forage intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 g</td>
<td>X</td>
<td>60</td>
<td>X</td>
<td>500</td>
<td>=</td>
<td>9 kg</td>
</tr>
<tr>
<td>0.4 g</td>
<td>X</td>
<td>60</td>
<td>X</td>
<td>500</td>
<td>=</td>
<td>12 kg</td>
</tr>
<tr>
<td>0.5 g</td>
<td>X</td>
<td>60</td>
<td>X</td>
<td>500</td>
<td>=</td>
<td>15 kg</td>
</tr>
</tbody>
</table>

2. Increased forage yield increases intake

Forage intake vs pasture height

![Graph showing forage intake vs pasture height]
Përgatitja e silazhit të mirë
Nga Dr. Dan Undersander
Universiteti i Wisconsin-it

- Menaxhimi i mirë redukton humbjet në fushë (mund të jetë deri në 30% për bar/ushqim leguminoz)
- Menaxhimi i mirë redukton humbjet e deponimit/magazinimit (mund të jetë deri në 30%)
- Menaxhimi i mirë nënkupton më shumë qumësht të prodhuar për tonë të silazhit
- Të korrat në fazën e duhur të kulturës bujqësore

1. Cilësia e ushqimit foragjer bie
   1. Cilësia e ushqimit foragjer bie me shtimin e pjekurisë në barëra dhe në ushqime leguminoze
   2. Kokrrat e misrit bëhen të vëshëra (forta) dhe nuk janë të përshtatshme për lopë

- Lagështi e duhur për silazhim të ushqimit të kafshëve
  1. Nëse është tepër e lartë → kullon, tharton, konsumim i dobët i kafshëve
  2. Nëse është tepër e ulët → myket, tretshmëri e dobët

- Minimizim i humbjeve në fushë
- Minimizim i oksigjenit në silo
  3. E grirë shkur (75% më pak se 1 cm, 20% më gjatë se 3 cm), kokrrat e thyera të dritihit
     ➢ Shtypje e mirë e tokës
     ➢ Acid laktik bakterial për përdorim të sheqerërave
     ➢ Disa copa të gjata për ripërtypje

4. Mbushni shpejt
   ➢ Silazhi nuk duhet ekspozuar në ajër më shumë se 4 ditë
5. Paketoni mirë

- Strehoni 4 deri 5 minuta për tonë me 5800 kg traktor në 1 shtrresë 2 cm
- Paketoni në seksione të rrafshëta ose paketoni në pyka rrítëse
- Minimizoni nxhtësinë

6. Mbësni për t’i mbajtur hermetikisht

- Menaxhoni ushqimin ashtu që të minimizoni humbjet. Mbani silazhin të mbuluar. në vija te drejta, mos i mbani grumbull pranë ushqimit tjetër.

Korrja: në kohër optimale dhe të duhur për bimët foragjere për të marrë sasi më të lartë të qumështit nga lopa.

Koha e korrjes së barit

- Korrja në kohën emergjente 1,330 lit qumësht

Kosjtja e tërfojës - Alfalfa

Kosite tërfojën alfalfë kur sythat kanë dalur por ende nuk është krijuar luluja. Prodhimtaria e qumështit nga të ushqyerit me bimë foragjere tek lopët e ushqyera kur kondicioni dhe shëndeti i lopëve është i dobët, ka aritur përmirësim në 6 muajt e parë të laktacionit.
Prodhimi i ushqimit foragjer cilësorë
Dr. Dan Undersander, Universiteti i Wisconsin-it

1) Qëllimi është që ushqimi foragjer te jetë me sa më shumë energji dhe proteina që është e mundur.
2) Zvogëlim i energjisë dhe proteinave në bar dhe ushqim leguminoz, sapo të rritet pjekuria.
3) Rritja e fibrët në barëra dhe ushqim leguminoz arrihet sipas rritjes së pjekurisë. Fibri i lartë mund të reduktojë konsumin e të dyjave, tagjisë dhe koncentratit në dietë dhe rezulton në prodhimin më të vogël të qumështit.
4) Prerja e barit në fazën e zhvillimit para lullëzimit (koka mezi duket) dhe ushqimi leguminoz në fazën e nxjerrjes së sythave është optimist për rendimentin dhe cilësinë ushqimit foragjer për lopët që prodhojnë qumësht.
5) Usqimi leguminoz ka më pak fibrë sesa bari, prandaj ka konsum më të lartë.
6) Silazhi (bari, jonxhe, tërfili dhe misri) duhet të vijhet në silo ose buker më lagësht 65%.
7) Të gjitha silazhet duhet të paketohen me kujdes në silo ose bunker për të përjashtuar oksigjenin.
8) Barërat dhe ushqimet leguminoze kanë nevojë për rrjetën e lëndëve ushqyese.

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