

Silage composed of *Opuntia ficus indica* f.
inermis cladodes, olive cake and wheat
bran as alternative feed for Barbarine lambs

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Introduction

Livestock

- o Most of livestock is raised in semiarid & arid regions

Serious feed shortage

- o Regression of rangelands (8 millions ha in the seventies vs 5.5 ha)
- o 87% of rangelands in arid areas
- o 80% collective rangelands
- o Mismanagement (stocking rate, continuous grazing)
- o Low fodder potential

- o Increased use of concentrate feeds & gross forages (cost !)

Better use of local feed resources (shrubs, AGIBPs, crop residues, etc.)

Introduction

Use of alternative resources

- *Availability*
- *Cost*
- *Efficiency*
- *Adapted to the arid and semi-arid*



Introduction

Huge quantity of olive cake

Low in digestible N

Low in energy

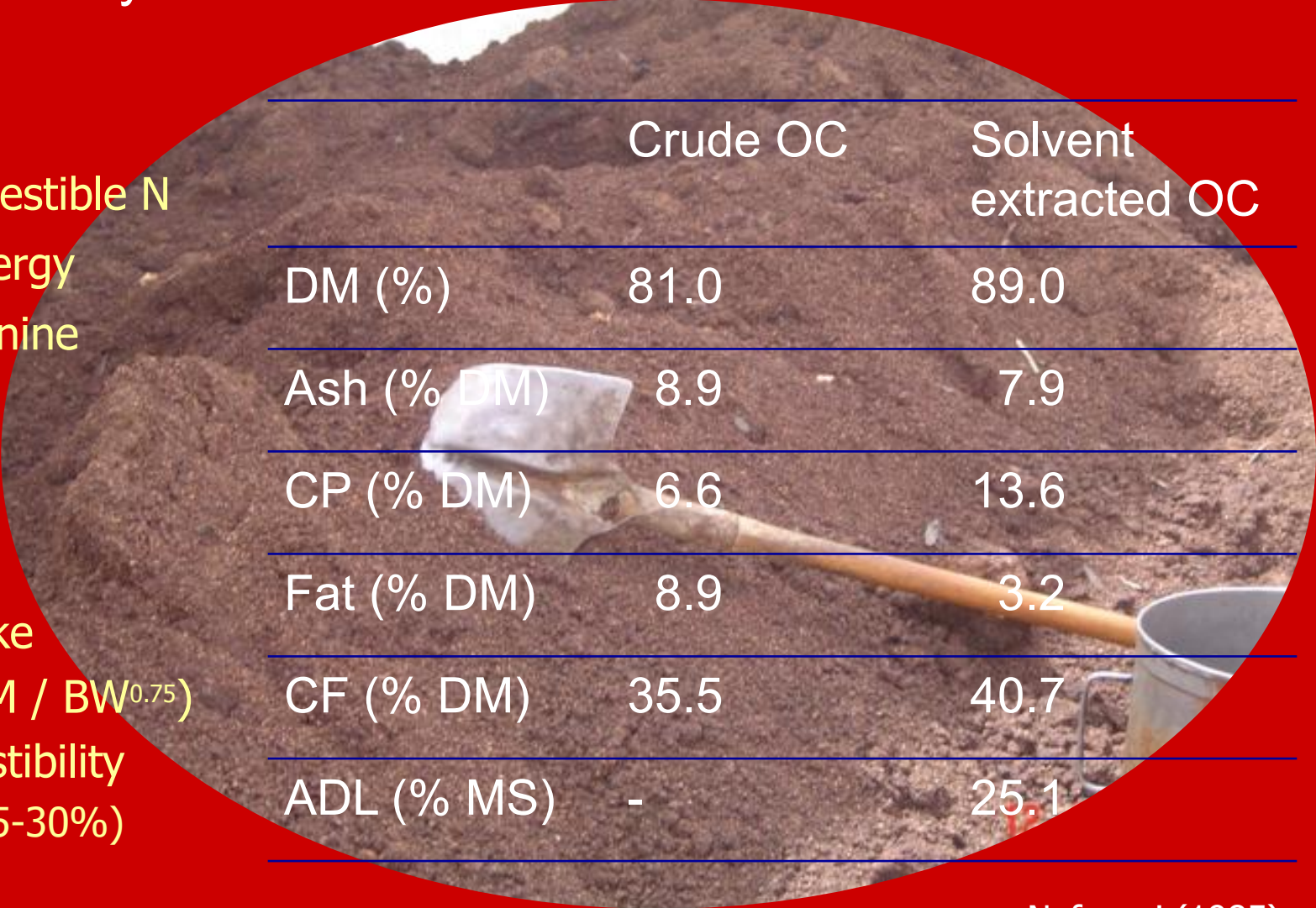
High in lignine

High intake

(120 g DM / BW^{0.75})

Low digestibility

(OMD = 25-30%)



| | Crude OC | Solvent extracted OC |
|------------|----------|-------------------------|
| DM (%) | 81.0 | 89.0 |
| Ash (% DM) | 8.9 | 7.9 |
| CP (% DM) | 6.6 | 13.6 |
| Fat (% DM) | 8.9 | 3.2 |
| CF (% DM) | 35.5 | 40.7 |
| ADL (% MS) | - | 25.1 |

Objective

- Using cactus instead of molasses (energy source).
- Nutritive value of cactus-olive cake & bran silage.
- Replacement value of silage concentrate and or oat hay given to Barbarine sheep.

Materials & methods

Silage: Olive cake (40%) + fresh cactus (35%) + Wheat bran (25%)

Cactus

{ + High in soluble carbohydrates and water
- Low in fiber and nitrogen

Olive cake

{ + Relatively high in fiber
- Low in nitrogen and energy

Wheat bran

{ + Source of protein

Materials & methods

Diet 1. Oaten hay + 400 g conc. (75% barley & 25% soyabean meal))

Diet 2. Silage + 400 g conc.

Diet 3. 50% diet 1 + Silage

18 Barbarine lambs (BW 32 kg , 10-month-old)

Adaptation: 19 days
Growth trial: 60 days
Digestibility trial: 11 days

- Daily gain
- Intake, digestibility, nitrogen balance and microbial N supply
- Meat quality

Results

Silage quality and chemical composition of feeds

| | Oat hay | Concentrate | Silage | Ingredient mixture before ensiling |
|---|---------|-------------|--------|---------------------------------------|
| Fermentation parameters of silage juice | | | | |
| pH | | | 4.55 | |
| Soluble N (% TN) | | | 30 | |
| Ammonia (% TN) | | | 4.4 | |
| Nutrients in feeds | | | | |
| DM (g/kg DM) | 907 | 897 | 528 | 725 |
| OM (g/kg DM) | 920 | 951 | 932 | 931 |
| CP (g/kg DM) | 40 | 197 | 133 | 107 |
| NDF (g/kg DM) | 628 | 315 | 547 | 653 |

Results

Feed intake and nutrient digestibility of diets

| | Control | S-diet | CS-diet | <i>P-value</i> |
|--------------------------------------|---------|---------|---------|----------------|
| DM intake (g/kg BW ^{0.75}) | 70.5 a | 64.1 a | 78.3 b | <0.001 |
| Diet digestibility (%) | | | | |
| OM | 66.6 a | 62.6 ab | 55.0 b | 0.013 |
| CP | 62.1 a | 66.3 a | 52.5 b | 0.001 |
| NDF | 57.6 a | 47.3 b | 45.6 b | 0.041 |

Results

Effect of diets on nitrogen balance and microbial N supply in sheep

| | Control | S-diet | CS-diet | <i>P-value</i> |
|-------------------------|---------|--------|---------|----------------|
| N intake (g/day) | 16.2 a | 22.4 b | 19.3 c | <0.001 |
| Faecal N (g/day) | 6.1 a | 7.6 ab | 9.3 b | 0.011 |
| Urinary N (g/day) | 1.9 a | 5.9 b | 2.0 a | <0.001 |
| Retained N (g/day) | 8.1 | 8.9 | 8.0 | ns |
| Microbial N (g/kg MODi) | 1.81 a | 3.11 b | 1.62 a | 0.042 |

Results

Effect of diets on daily gain, carcass yield and intramuscular fatty acid composition in sheep

| | Control | S-diet | CS-diet | <i>P-value</i> |
|---------------|---------|--------|---------|----------------|
| Daily gain | 33.9 | 31.3 | 31.2 | ns |
| Carcass yield | 40.4 | 43.2 | 41.9 | ns |
| SFA | 38.2 | 35.6 | 36.9 | ns |
| PUFA | 28.3 | 31.6 | 27.4 | ns |
| Omega 6 | 21.2 ab | 26.2 a | 19.8 b | 0.013 |
| Omega 3 | 6.9 a | 5.8 ab | 5.3 b | 0.020 |
| 6/3 | 3.1 | 4.5 | 3.8 | ns |

Conclusions

- ✓ Ensiling the mixture olive cake, cactus and wheat bran
 - ↳ Easy technique and good quality
 - ↳ Silage can replace totally oaten hay without affecting intake and digestibility in lambs
 - ↳ Silage can replace totally or partially oaten hay with or without concentrate without affecting growth and meat quality