

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

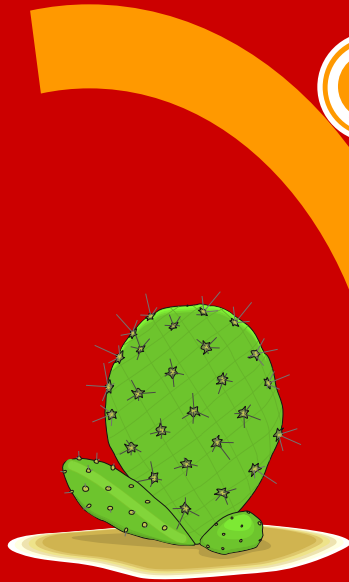
S. Abidi¹, H. Ben Salem¹, A. Nefzaoui², V. Vasta³, A. Priolo³

¹INRAT, Tunisia

²ICARDA

³University of Catania, Italy

Outline



1

Introduction

2

Objective

3

Materiels & methods

4

Main results

5

Conclusion

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

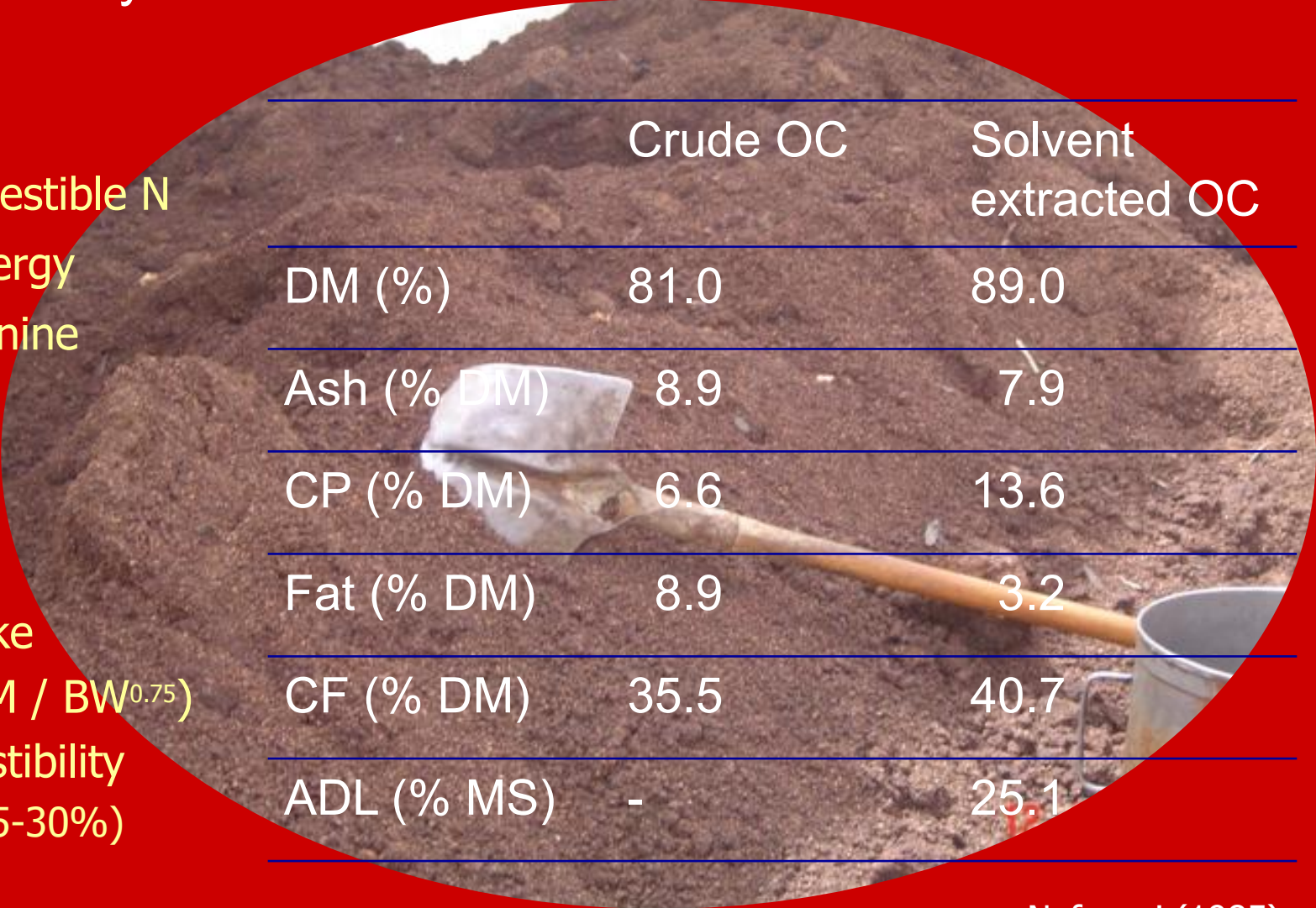
High in lignine

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