



*Rapeseed-cake: an interesting raw material for livestock feeding*

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# Introduction



crop seeds



cold press



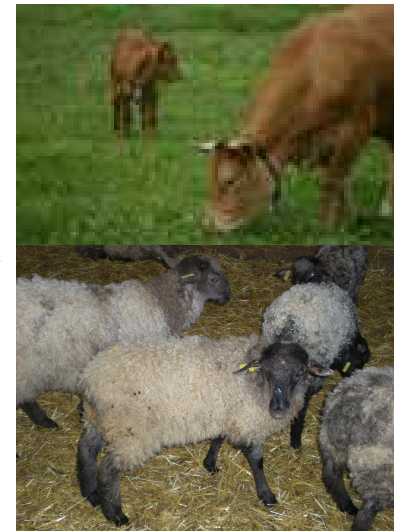
Co-product: cake



vegetable oil

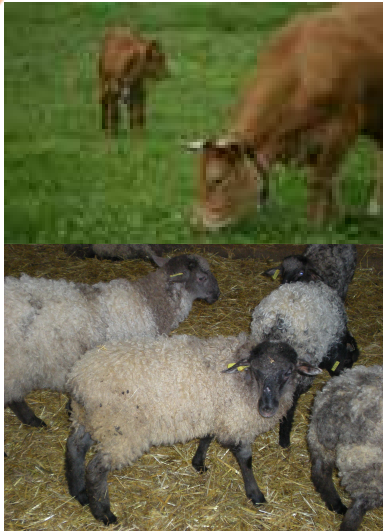


engine fuel



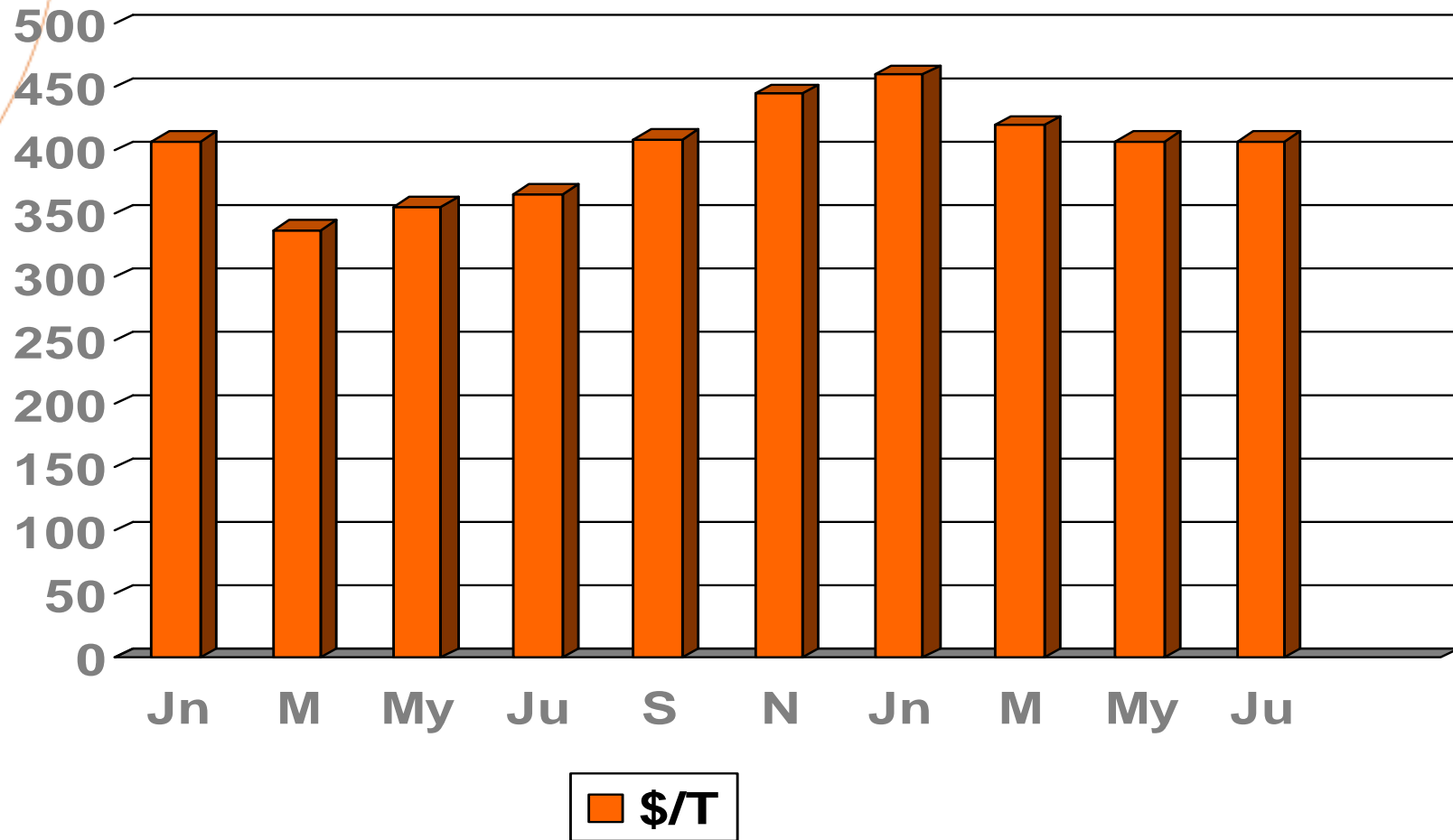
Animal feedstuff

# Introducción



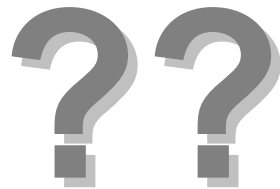
	Crude Protein	Fat
<b>Soybean meal</b>	<b>44%</b>	<b>2%</b>
<b>Rapeseed meal</b>	<b>30%</b>	<b>16%</b>
<b>Sunflower meal</b>	<b>25%</b>	<b>11%</b>

## Introduction



***Interest: To have alternative protein sources less subject to market price fluctuations***

# Introduction



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***Can we substitute soybean meal by cold-pressed cakes obtained on-farm???***

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## Material and methods

### ➤ Animals and experimental diets



- **36 Latxa dairy ewes**

- Multiparous
- Mean daily milk production:  $1976 \pm 276$  g
- Days in milk:  $16 \pm 9$  d
- Mean body weight:  $67.5 \pm 8.5$  kg



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## Material and methods

### ➤ Animals and experimental diets



- 36 Latxa dairy ewes
- Different concentrates:
  - **sunflower cake**
  - **rapeseed cake**
  - **soybean meal**

## Material and methods

### ➤ Animals and experimental diets

<i>Concentrates</i>	<b>Sunflower cake</b>	<b>Rapeseed cake</b>	<b>Soybean meal</b>
Organic matter (%)	93	90	93
Crude Protein (%)	15	15	15
NDF (%)	31	20	27
ADF (%)	18	11	11
Fat (%)	11	11	5
Energy (UFL)	1	1	1

- ✓ Supplements designed to be provide equal amounts of CP and UFL
- ✓ But...the energies are *different*



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## Material and methods

### ➤ Animals and experimental diets



- 36 ovejas
- Different concentrates:
  - sunflower cake
  - rapeseed cake
  - soybean meal
- Fescue hay offered *ad libitum*

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# Material and methods

## ➤ Experimental design

- Adaptation

- Sampling



- Day milk yield

- Day milk yield adjusted to 6.5% fat

- Milk analysis

- Protein
- Fat
- Fatty acid profile

- Dry matter intake determination

- Concentrate
- Fescue hay

- Body weight

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# Material and methods

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## ➤ Statistics

- $Y_{ijk} = \mu + A_i + \varepsilon_{ij}$

- Repeated measures:

- Yields and FCM
- Milk contents
- FA profile

- ANOVA:

- Intake
- Body weight




# Results

Item	Concentrate			SEM	P
	SOY	RPS	SUN		
<b>DMI, kg/d</b>					
Total	2.70	2.64	2.68	0.077	0.612
Fescue	1.87	1.83	1.86	0.072	0.683
Concentrate	0.82	0.81	0.82	0.011	0.399
<b>Yields, g/d</b>					
Milk	2001	1940	1918	89.0	0.792
6,5% FCM	1900 <sup>a</sup>	1865 <sup>a</sup>	1616 <sup>b</sup>	84.5	0.038
Fat	120.1 <sup>a</sup>	118.1 <sup>a</sup>	93.6 <sup>b</sup>	5.83	0.002
Protein	89.0	84.1	83.2	3.88	0.520
<b>Composition, %</b>					
Fat	6.2 <sup>a</sup>	6.1 <sup>a</sup>	4.9 <sup>b</sup>	0.16	<0.001
Protein	4.5	4.4	4.3	0.08	0.414
<b>Body weight, kg</b>					
Initial	70.3	70.7	69.4	3.21	0.684
Final	70.0	70.3	69.6	3.24	0.833
<b>Fatty Acid, g/100g FA</b>					
9c,11t CLA	0.9 <sup>c</sup>	1.4 <sup>b</sup>	2.4 <sup>a</sup>	0.09	<0.001
<i>De novo</i>	41.0 <sup>a</sup>	28.0 <sup>b</sup>	24.7 <sup>c</sup>	0.71	<0.001
Total saturates	67.4 <sup>a</sup>	55.5 <sup>b</sup>	51.4 <sup>c</sup>	0.76	<0.001
Monounsaturated	26.9 <sup>b</sup>	38.2 <sup>a</sup>	39.3 <sup>a</sup>	0.63	<0.001
Polyunsaturated	4.7 <sup>b</sup>	4.9 <sup>b</sup>	6.8 <sup>a</sup>	0.71	<0.001



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## Conclusion

- The substitution of soybean meal by cold-pressed rapeseed or sunflower cakes obtained on-farm did not affect milk yield
  - Supplementation with cold-pressed sunflower reduced milk fat concentration and fat corrected milk
  - Supplementation with cold-pressed cakes increased the level of polyunsaturated fatty acids and conjugated linoleic acids in milk
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A photograph of a vast field of bright yellow flowers, likely rapeseed, in the foreground. In the background, there is a long, white building with a red roof and a tall, white tower with a red top. The sky is a clear, pale blue.

***Thanks for your attention***