



➤ Nutritional value of ensiled lucerne and red clover leaves and their impacts on growth performance in finishing pigs.

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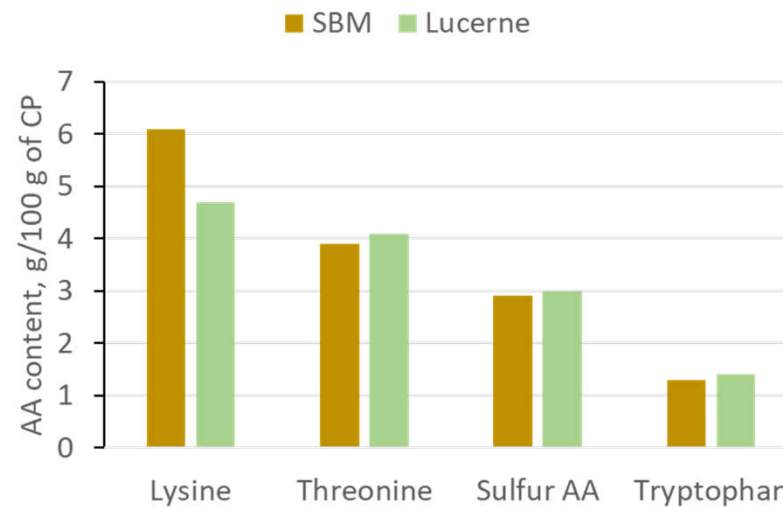


➤ Legume forages as feed for pigs



- Main interests of legume forages

- Good growth without fertilizers in a wide range of environmental conditions
- High DM and protein yields (when compared to annual crops)
- High protein quality (when compared to SBM)



From INRA Tables



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- **Main interests of legume forages**
 - Good growth without fertilizers in a wide range of environmental conditions
 - High DM and protein yields (when compared to annual crops)
 - High protein quality (when compared to SBM)
 - The inclusion of forage legumes in swine diet would help to develop a circular economy
- **Main limitations of legume forages for feeding pigs**
 - Problems for a long-term preservation of the grass
 - High fiber content in the whole plant = ↗ bulk density
 - Presence of others ANF (saponins, etc.) = ↘ energy and protein digestibility



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- Main interests of forages legumes

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- Main limitations of forages legumes for pig feeding

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	Leaves	Stems
Fraction yield, g/100 g DM	35.6	64.4
N×6.25, %	27.7	10.7
Hemicellulose	8.8	22.0
Cellulose	14.2	37.2
Lignin	3.6	4.9

From Bourquin and Fahey, 1994



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Objectives of the present study

- Evaluate the nutritional values of lucerne and red clover leaves distributed in silage form
- Use these silages in a validation feed trial involving finishing pigs



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➤ Material and methods : digestibility trials



- Measurements of the total tract energy digestibility
 - 3 dietary treatments
 - a control diet (C) based on wheat-SBM
 - a C+22% of lucerne silage (LS)
 - a C+22% of red clover silage (RS)
 - 14 d adaptation and 7 d collection of faeces and urines after 14 d of adaptation
 - 5 pigs (68 kg BW) / dietary treatment
- Measurements of ileal AA digestibility
 - 3 dietary treatments
 - a control diet (C) based on corn starch-casein
 - a C+15% of LS
 - a C+15% of RS
 - 4 d of adaptation and 3 d collection of ileal juices
 - 6 measurements/dietary treatment in a LS design



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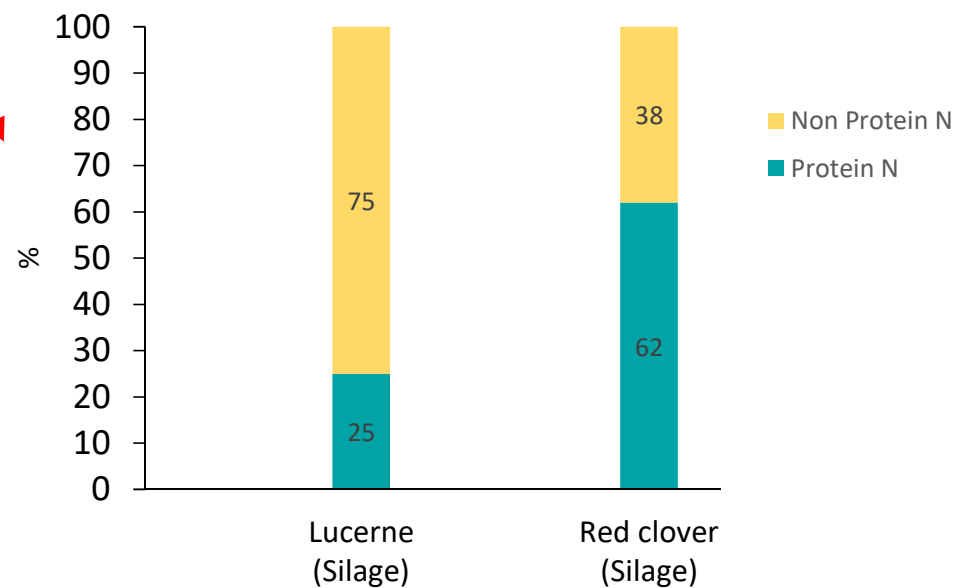
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➤ Results : Chemical composition of LS and RS



	Lucerne	Red clover
Dry matter (DM), %	24.5	27.4
Total N, % DM	4.2	3.1
NDF, % DM	25.8	29.3
ADF, % DM	10.4	11.5
ADL, %DM	2.1	2.2
Gross energy, MJ/kg DM	20.4	19.9



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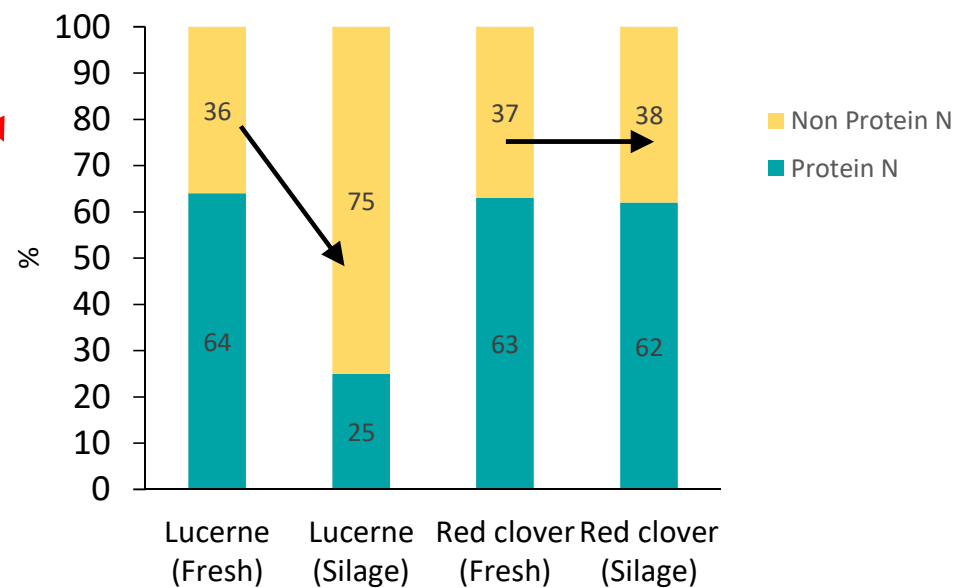
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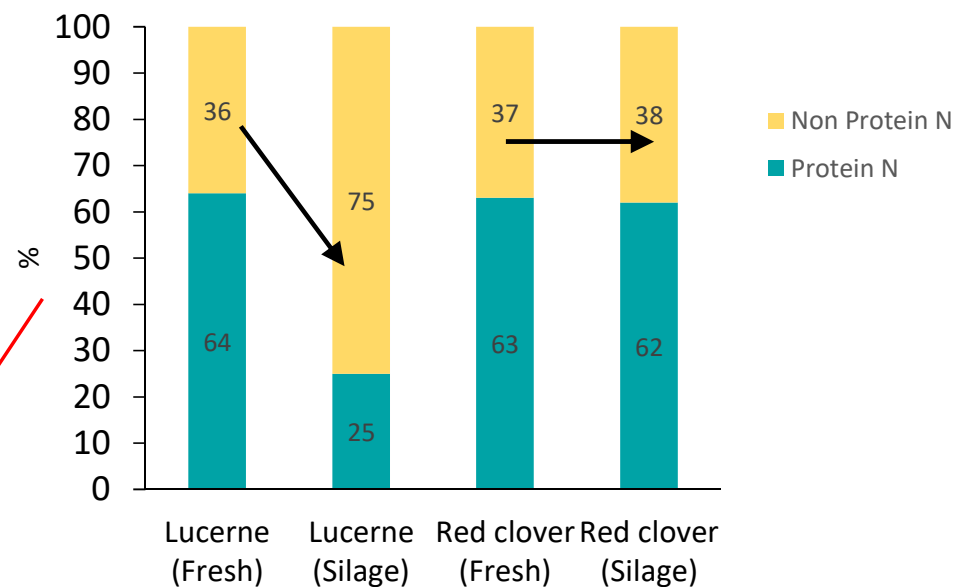
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Gross energy, MJ/kg DM	20.4	19.9
Amino acids, % DM		
Lys	0.21	0.86
Thr	0.14	0.72
SAA	0.28	0.37
Σ Essential AA, %DM	3.95	7.27



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➤ Results : Nutritional value of LS and RS



	Lucerne	Red clover
TTD of GE, %	72.8	71.5
DE, MJ/kg DM	14.9	14.2
ME, MJ/kg DM	14.3	13.9



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➤ Results : Nutritional value of LS and RS



	Lucerne	Red clover
TTD of GE, %	72.8	71.5
DE, MJ/kg DM	14.9	14.2
ME, MJ/kg DM	14.3	13.9
SID amino acids, g/kg DM [digestibility, %]		
Lys	0.0 [<0.0]	4.7 [55.1]
Thr	0.0 [<0.0]	2.9 [40.2]
SAA	1.2 [23.1]	1.7 [36.0]
∑ Essential AA	19.1	43.3



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➤ Results : Nutritional values of LLS and RLS

Partial conclusions



- Silages from lucerne and red clover are energy sources rather than protein sources for pigs
- Low SID AA content due their low digestibility (fiber ?) and high rate of proteolysis in lucerne silage
- The utilization of legumes silages should be recommended in finishing pigs or in gestating SOWS
- How can we formulate a complete ration for pigs using leguminous silage ?



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➤ Material and methods : Validation trial



- 60 finishing pigs (30 barrows and 30 females) with an initial BW=97 kg
- 10 d adaptation + 16 d of measurements
- 5 experimental dietary treatments (2.6 kg DM/d)
 - T1: A control R1 diet
 - T2: A mixture of 10% of LS + 90% of R2
 - T3: A mixture of 10% of RS + 90% of R2
 - T4: A mixture of 20% of LS + 80% of R3
 - T5: A mixture of 20% of RS + 80% of R3
- Measurements
 - Initial and final BW
 - Feed intake
 - Carcass composition

	NE, MJ/kg	SID Lys, g/kg
R1	9.5	5.4
R2	9.6	5.6
R3	9.7	5.8

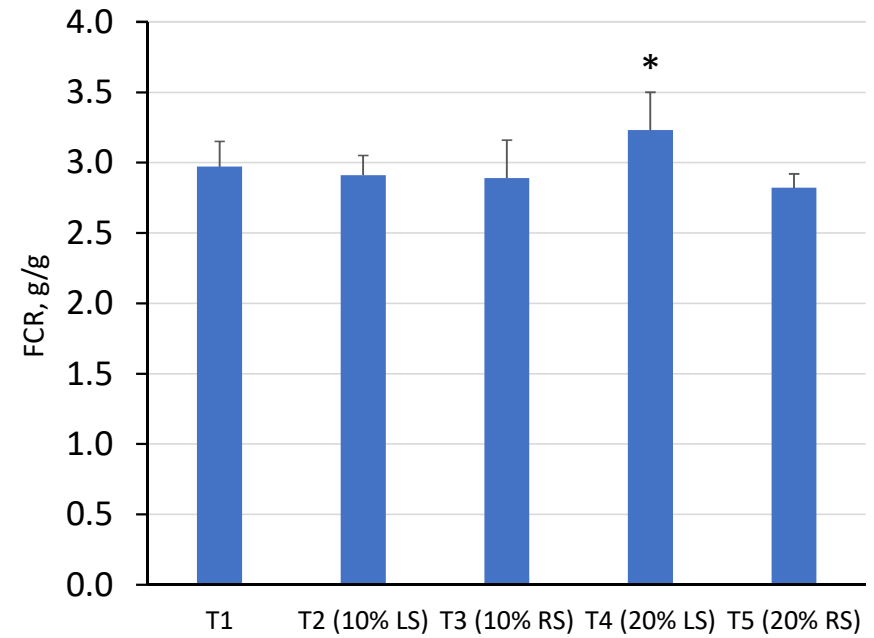
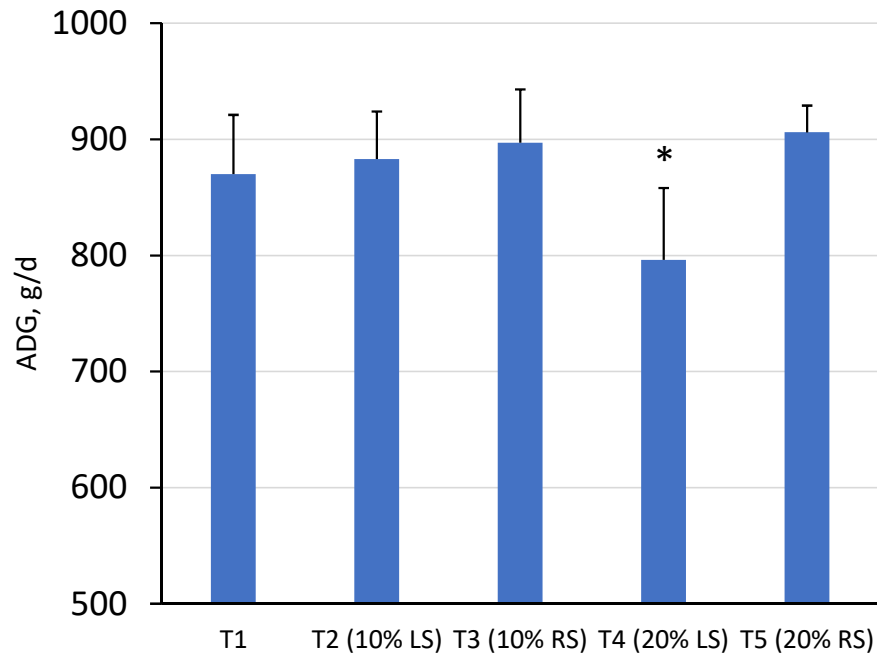


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➤ Results : Growth performance



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➤ Conclusions



- Silages from lucerne and red clover are valuable energy sources in finishing pigs but they are poor in digestible AA
- Strategies have to be implemented for reducing the protein breakdown in lucerne silage
- With an appropriate complementary feed, red clover silage can be fed at a rate of 20% without any negative consequences on growth and carcass performance
- Lucerne silage has to be limited at a rate 10%



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