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## Legumes as protein feed for dairy bull calves

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### Why?


- Soybean meal
  - Great protein feed but
  - Ethical concerns








### Götala research station in Skara





### Stables for cattle


- Uninsulated, deep straw, 72-84 cattle
- Isolated, slatted floor, 64 cattle
- Tied system, 8 animals



### Stable for sheep



### Animals



- 84 dairy bull calves per year
- Aged 2.5 to 7.5 months
- 3 protein feeds per year
- TMR grass/clover silage and rolled barley



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## Protein feed vs imported soybean meal


- Year 1, Peas – Field beans
- Year 2, Dry distillers grains – Swedish soybean
- Year 3, Peas – Lupins
- Year 4, Clover-rich silage
- Year 5, combinations

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## Studied parameters


- Feed intake
- Live weight gain (90-245, 93-271, 98-289, 94-250 kg)
- Feed efficiency
- Faeces – rumen function
- Profitability



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## Chemical composition (g/kg DM)

	Peas	Field beans	Dry DGS	Sw. soy bean	Lupin	Rapeseed cake	Soy bean meal
DM, %	82-89	87	90	82	77	89-92	82-87
ME, MJ	13.9-14.0	13.8	13.7	15.6	13.4	15.1-17.4	14.0-14.7
CP	211-232	281	349	400	276	296-348	510-528
Fat	21-26	20	68	158	60	150-253	24-31
Ash	30	37	49	54	34	57-64	61-65
NDF	99-137	126	335	138	219	235-277	115-199
Starch	578-581	498	25	63	296	18-25	38-119



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## Feed intake and weight gain, year 1



- No significant difference in weight gain
- Tendency for higher energy intake from Peas

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## Feed intake and weight gain, year 2



- Dry distillers grains tendency for higher DM intake
- Dry distillers grains higher live weight gain

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## Feed intake and weight gain, year 3



- Peas and Lupins higher DM intake than SBM
- Peas and Lupins higher weight gain than SBM



## Chemical composition (g/kg DM)

	Silage Year 4	Clover Year 4π
DM, %	40	33
ME, MJ	11.2	10.8
CP	124	144
Ash	63	83
NDF	522	410



## Feed intake and weight gain, year 4



- 0,2 kg rapeseed cake and clover rich silage gave a lower intake and weight gain than 0,5 kg rapeseed cake or SBM



## Rumen function, year 1 and 2

- No differences year 1
- Dry DGS and Sw. soybean gave firmer consistency and higher DM of faeces year 2
- Generally no advantages or disadvantages



## Conclusion



- Locally grown protein feeds can replace soybean meal with maintained or improved performance.
- In the basic price situation P and DDGS most profitable (Y 1 and 2)

