

Brüssel, 25th of april 2018

Workshop on „Research & Innovation in Plant Proteins“

Integration of protein crops in cropping systems and agricultural landscapes

Hans-Joachim Laue, FH Kiel, FB Agrarwirtschaft

Project of the Operational Group (OG)

## **“Indigenous Protein Plants”**

in the context of the European Innovation Partnership (EIP)

## **“Productivity and Sustainability in Agriculture”**

Title:

**Development of a multi-instrument concept for the economic feeding of grain legumes concerning cattle and pig in Schleswig-Holstein (most northern province of Germany) in organic and conventional farming**

Project-editor: M.Sc.agr. Dana Ohm

Time: 2015 – may 2018

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## Inhaltsstoffe ausgewählter Proteinträger (g/kg TM):

	ME	NEL	XP	nXP	UDP	Lys	Met
SES	13,8	8,6	500	291	30%	30	6,8
RES	11,8	7,1	392	254	35%	21	7,6
AB	13,6	8,6	295	198	18%	19	2,3
LP blau	14,5	8,3	350	221	20%	17	2,5

(nach DLG, 2015)

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## Heat-treatments of vicia faba

- Muschiolik, G., Schmandtke, H., 2000:
  - > 5 minutes, 120 oC: 70 % less Trypsininhibitor
- Bissinger, C., Schneider, K., Steingass, H., 2007:
  - > no increase of milkyield
- Preißinger, A., Obermaier, S., Steinberger, S., 2008:
  - > treatet beans -> better digestibility

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# 1. Preliminary experiment with a stationary expander

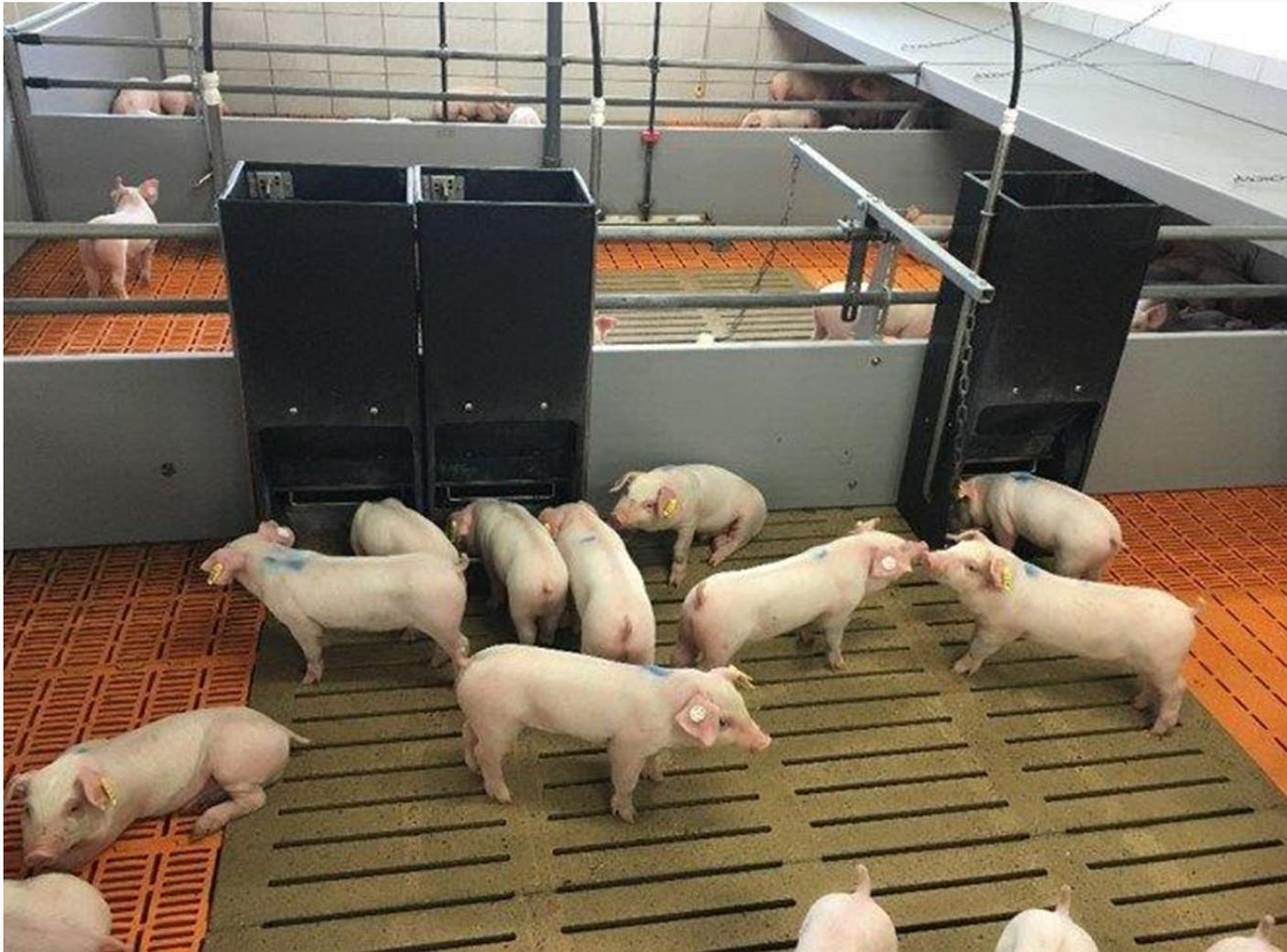
## Vicia faba in raising of piglets

M.Sc.agr. Krüger, G.; Prof. Dr. Laue, H.-J., 2016

### Description:

- 129 piglets
- 3 feeding groups:
  - „standard“ → concentrate with soja-extr.-meal
  - „beans“ → concentrate with untreated beans
  - „beans treated“ → concentrate with treated beans
- 43 days, divided in 2 times with different rations
- Liquid feed dispenser

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**Table 1: Contents of the concentrate feeds**

	std I	beans I	b. treated I	std II	beans II	b. treated II
<b>% beans i. FM</b>	0	5	5	0	10	10
<b>MJ ME/kg DM</b>	14,0	14,0	14,0	13,6	13,6	13,5
<b>g pcdXP/kg DM</b>	149,1	148,0	147,6	150,2	143,8	143,4
<b>g pcd L/kg DM</b>	12,1	11,9	11,9	11,6	11,5	11,4
<b>g pcd M/kg DM</b>	7,0	6,9	6,9	6,9	6,8	6,8
<b>g pcd Th/kg DM</b>	7,2	7,1	7,1	7,2	7,2	7,2
<b>g pcd Tr/kg DM</b>	2,3	2,3	2,3	2,3	2,2	2,2

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**Tabelle 2: Results of the piglets (26. – 69. day of life)**

	unit	std	beans	bea. treated
N	n	65	32	32
mass 1	kg	7,2a	7,2a	7,0a
mass 2	kg	10,7a	10,3a	10,8a
mass 3	kg	26,8a	23,9b	27,5a
daily gain 1	g	209a	182a	225a
daily gain 2	g	618a	525b	643a
<b>daily gain</b>	<b>g</b>	<b>456a</b>	<b>390b</b>	<b>477a</b>
feed intake	g	783	742	786
feed efficiency	kg	1,71	1,91	1,64
	MJ ME/kg	23,9	26,5	22,8

Different letters = significant ( $p \leq 5\%$ )

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## 2. Preliminary experiment with a stationary expander

# Vicia faba in rearing calves

B.Sc.agr. Weingang, J.; Prof. Dr. Laue, H.-J., 2016

### Description of the experiment:

- 158 male calves (Holstein-Friesian)
- 3 groups:
  - „Standard“ → concentrate with Rapeseed meal (RSM)
  - „beans“ → concentrate with untreated beans
  - „beans treated“ → concentrate with treated beans
- 8-weeks
- Same amount of milk; hay and water ad libitum
- Starting with about 17 days of age

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**Table 3: Contents of the concentrate feeds**

	Unit	std	beans	b. treated
% beans	(% in FM)	-	20	20
%RSM	(% d. FM)	23	15	15
energy	MJ ME/kg DM	11,2	11,2	11,2
XP	g/kg DM	180	180	180
XL	g/kg DM	43	40	41
XF	g/kg DM	84	83	83

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**Table 4: Results of the calves (7-11. week of live)**

	unit	Std.	beans	b. treated
number	n	51	53	54
mass 2	kg	81,5a	84,0b	81,1a
mass 3	kg	109,9a	110,3a	110,3a
daily gain	g	1014a	941b	1045a
MR/d	kg	0,327	0,32	0,331
hay/d	kg	0,142	0,145	0,145
TMR/d	kg	0,521	0,526	0,489
Conc./d	kg	1,78	1,7	1,71
feed efficiency	MJ ME/kg	26,28	27,41	24,72

Different letters = significant ( $p \leq 5\%$ )

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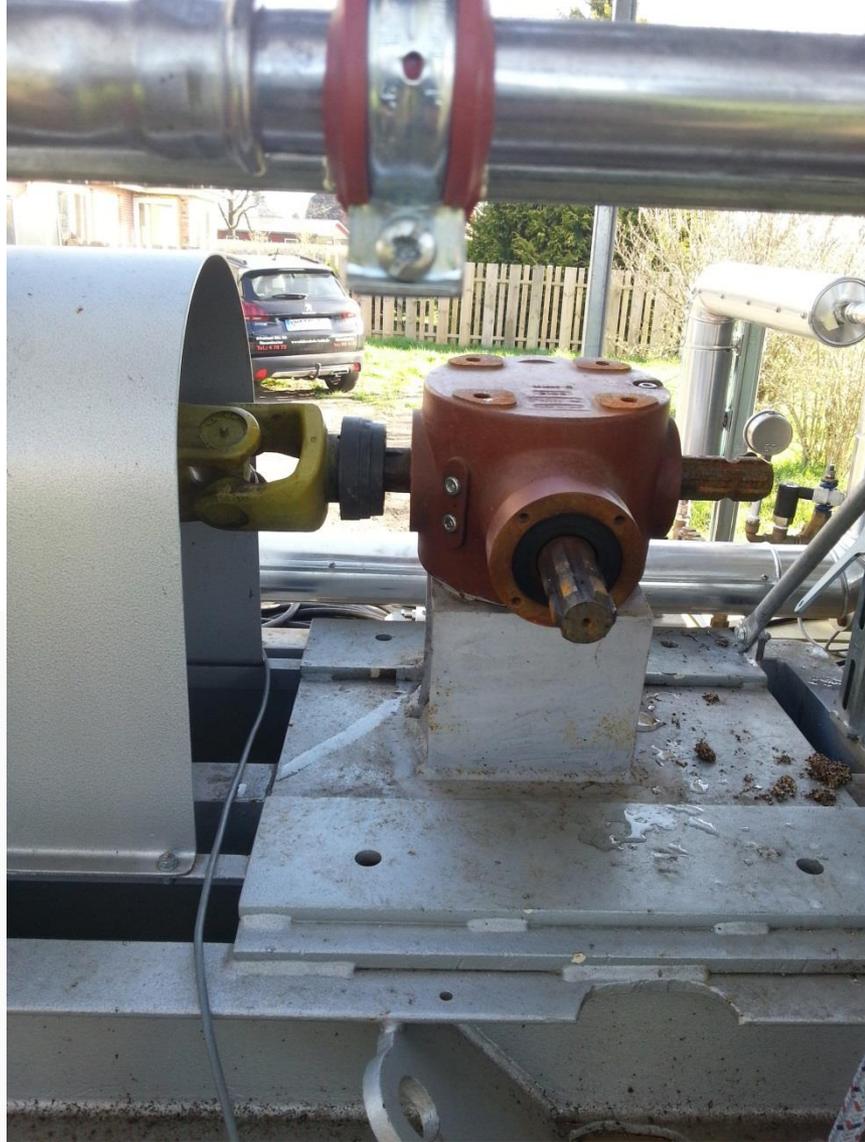
## Conclusions:

1. Higher daily gain with treated beans on pigs and calves (expansion with about 140 °C)
2. Farmers with beans and animals don't want to sell the beans
3. A mobile expander could be meaningful

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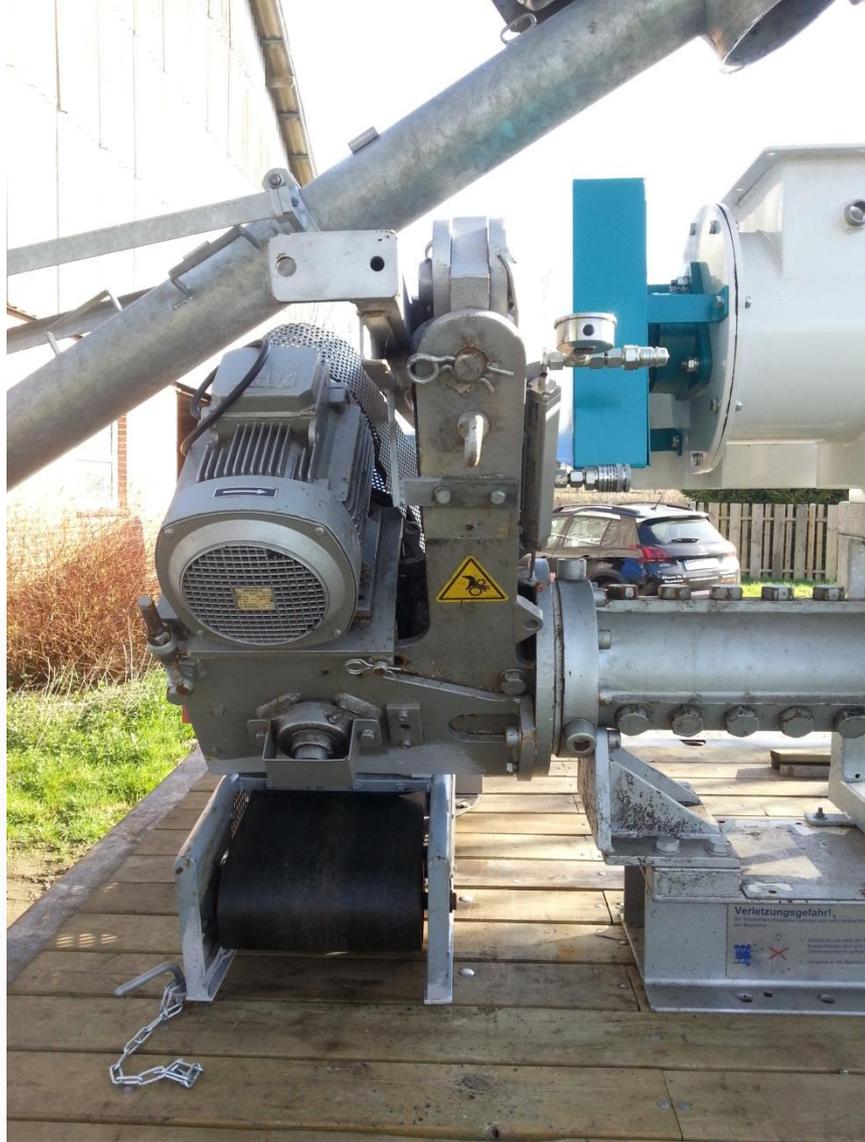
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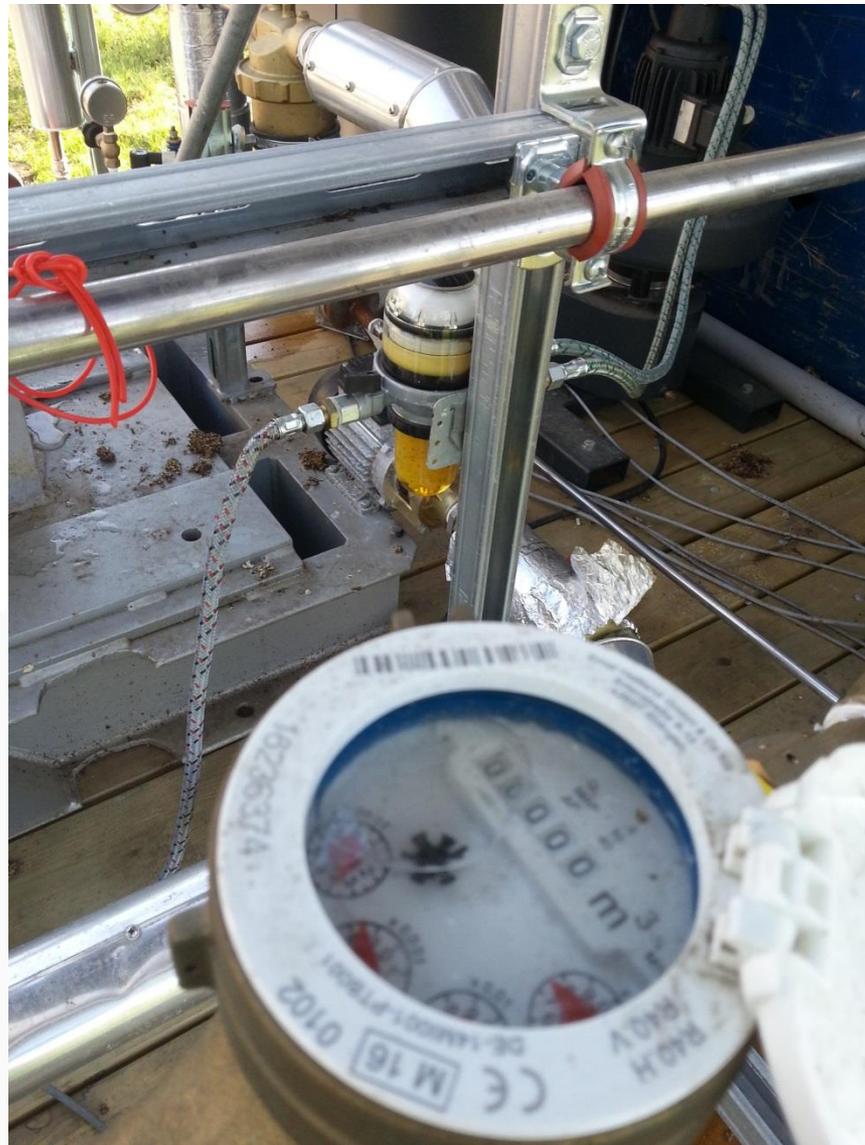
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Current situation:

we have

- the first mobile expander
- suitable experimental farms with pigs and cows
- but no money to continue

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Thank you for your attention!

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