

Berlin, November 4th 2016

**Erik Fog**

# PRODUCTION AND USE OF LEGUMES IN DENMARK – CHALLENGES AND PROSPECTS. CAN CHANGED USE OF LEGUMES PROMOTE A MORE SUSTAINABLE / MORE ORGANIC AGRICULTURE?

European Agricultural Fund for Rural Development:  
Denmark and Europe invest in rural development

Ministry of Food, Agriculture  
and Fisheries of Denmark



STØTTET AF

**promilleafgiftsfonden**  
for landbrug



# OUTLINE

- Background
- Changes in the role of legumes
- Soy dominance – actual status
- Other legumes
- Legumes in organic farming
- Bio-refined protein from clover – a game-changer?

# BACKGROUND

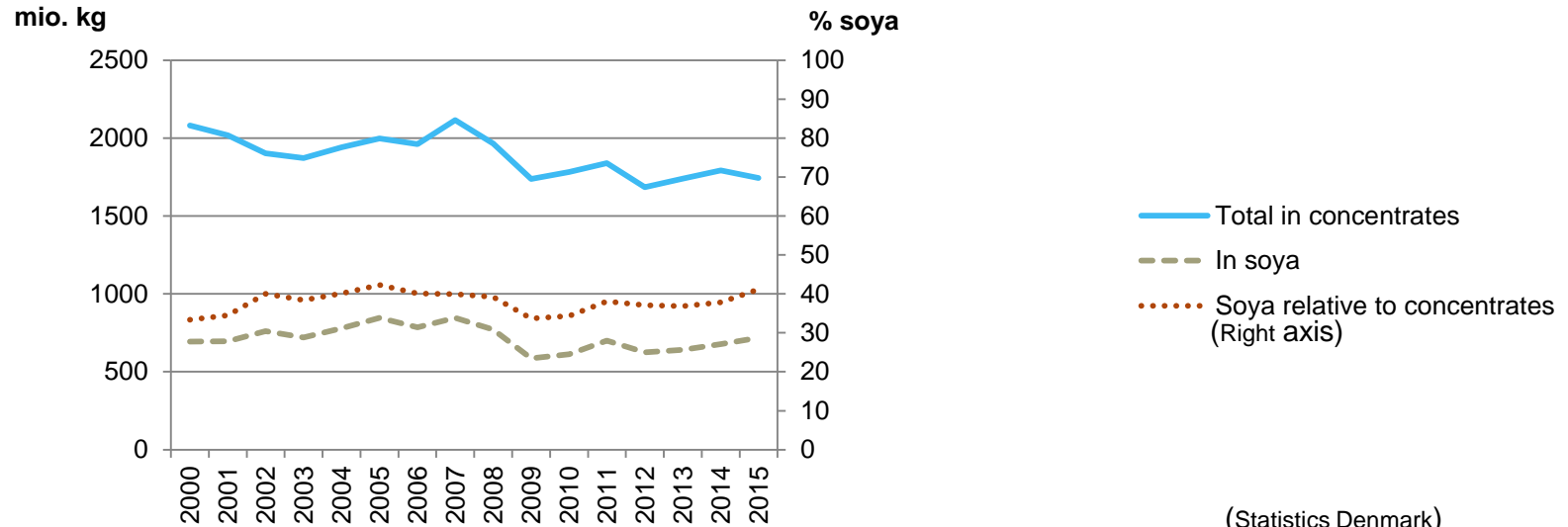
- SEGES the national innovation, business and service center for Danish agriculture .
- Part of The Danish Agriculture and Food Council
- Erik Fog, senior advisor on organic farming since 1987.
- Projects: Eco-Protein and OrganoFinery

# THE ROLE OF LEGUMES

- First of all a protein source for animal feed
- Other positive characteristics: Nitrogen fixation, improvement of rotations.
- New interests in domestic production of proteins:
  - Minimizing the carbon footprint from animal feed
  - Avoiding GM-products in the feed
  - Less vulnerable to prize fluctuations in the world market

# THE DOMINANCE OF SOYA PROTEIN

Danish consumption of crude protein in concentrates



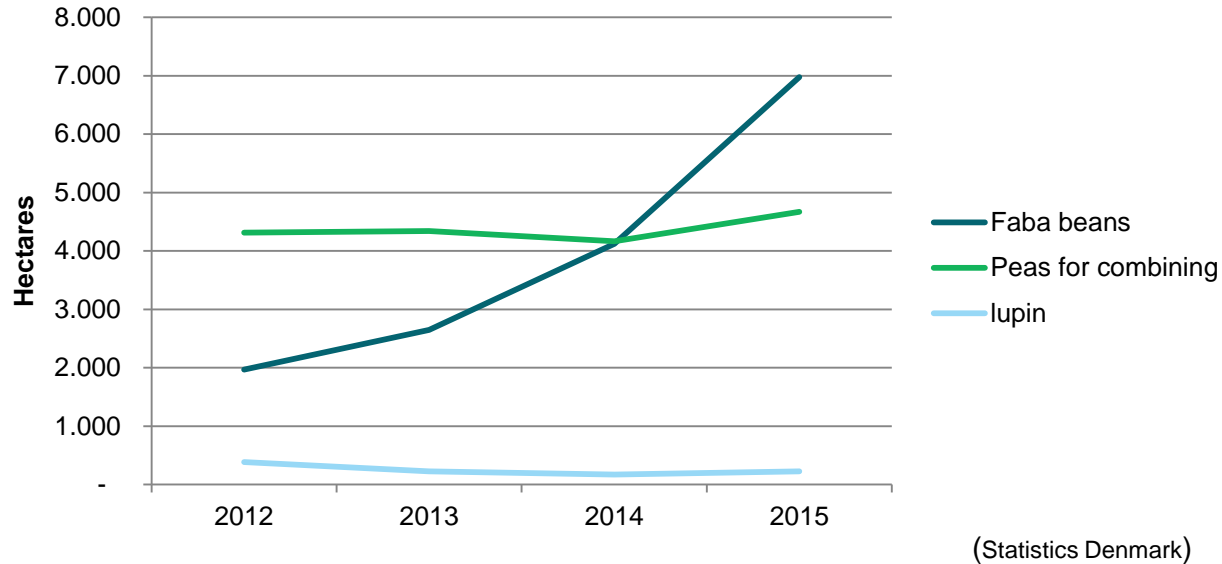
# THE DOMINANCE OF SOYA PROTEIN

Feed source	% of total crude protein consumption
Soya	39
Fish products	9
Rape cakes	7
Sunflower cakes	5
Pulses + dried Lucerne, Grass	2
Cereals	35

(Statistics Denmark)

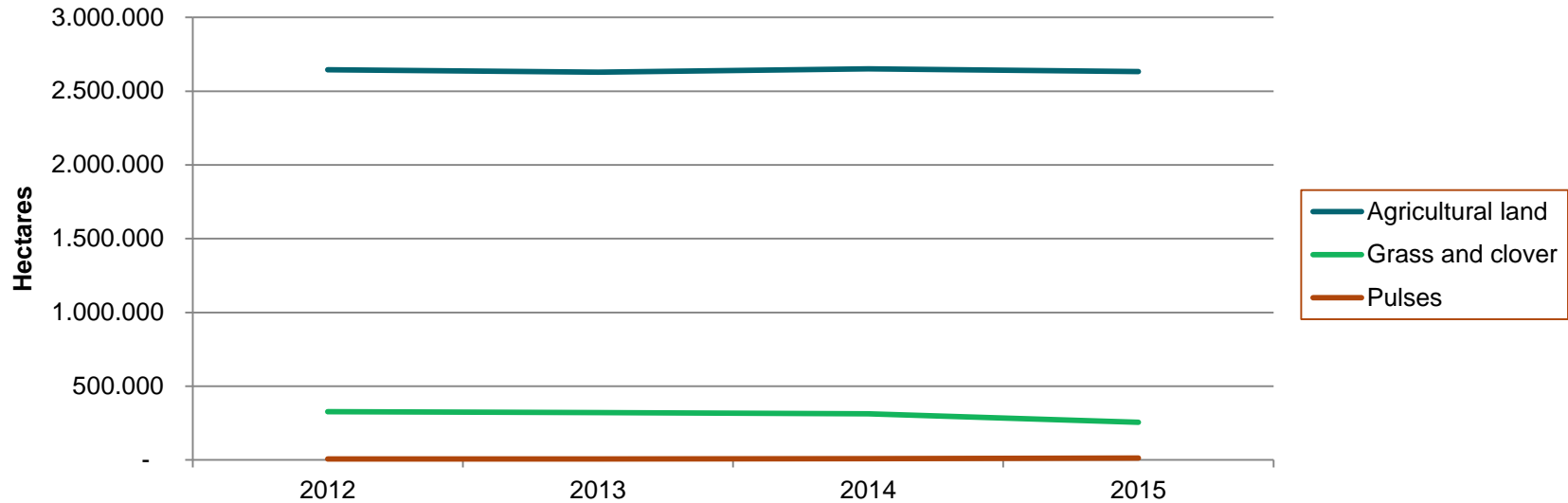
# CULTIVATION OF PULSES IN DENMARK

## Hectares with pulses



# LEGUMES ARE STILL MINOR CROPS

## Legumes compared to total agricultural area

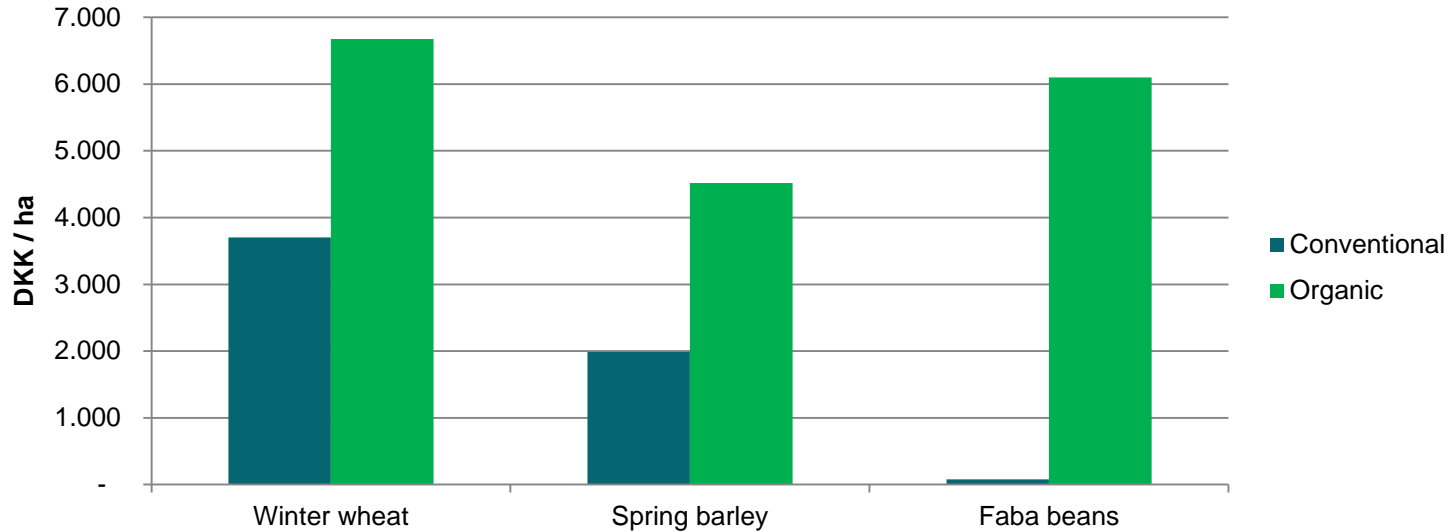


(Statistics Denmark)



# ECONOMIC VALUE OF FABA BEANS

## Contribution margin per hectare



(Farmtal Online, SEGES)

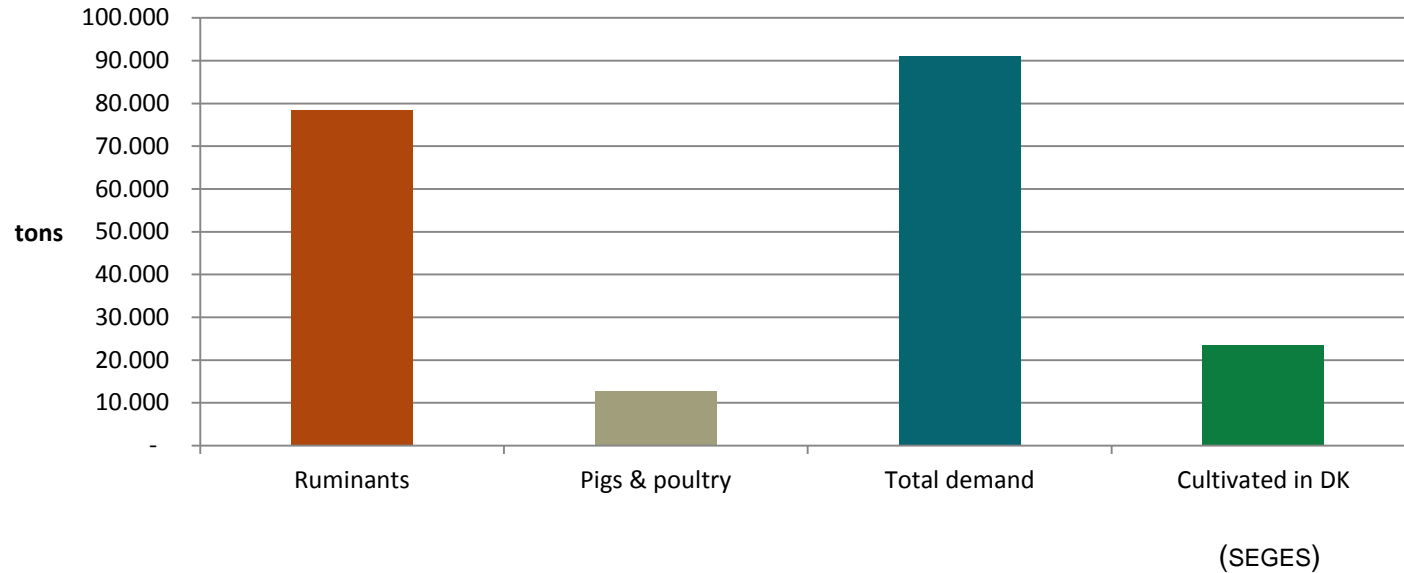
# ORGANIC FARMING IS PROMOTING LEGUME CULTIVATION

2012-15	Organic (% of total area)
Agricultural land	5,8
Grass and clover	36,6
Faba beans	62,4
Peas	28,5
Lupins	85,3

(Statistics Denmark)

# MORE PRODUCTION NEEDED TO MEET THE DEMAND

**Demand and production of grain legumes  
for organic livestock (2015)**



# GRASS PROTEIN FOR MONOGASTRIC ANIMALS

	Field pea	Faba beans	Lupin	GC conc.	Soya
Protein, % of dry matter	24	29	34	40	40
Amino acids, % of protein					
Cystine	1,4	1,2	1,5	0,6	1,5
Lysine	7,2	6,3	4,7	5,9	6,2
Methionine	1,0	0,8	0,7	2,0	1,4

(SEGES)

# HIGH PROTEIN PRODUCTION IN GRASS CLOVER

	Grass clover	Faba beans
Yield (Dry matter per ha)	14,0 tons	5,5 tons
Crude protein per ha	2,0 tons	1,5 tons

(SEGES)

- Plus extra value from grass clover in:
  - Nitrogen for the succeeding crops
  - Carbon sequestration in the soil
  - Feed for cattle or biogas production

# GRASS CLOVER– THE NEW PROTEIN SOURCE



# DEVELOPMENT OF BIO-REFINED GRASS PROTEIN

- Danish projects working on the production of protein from grass clover (cultivation, bio-refining techniques, feed value):
  - OrganoFinery
  - BioValue
  - MultiPlant

