

# Ekologiskt kretsloppsjordbruk Ecological Recycling Agriculture (ERA) Ecological Regenerative Agriculture (ERA)



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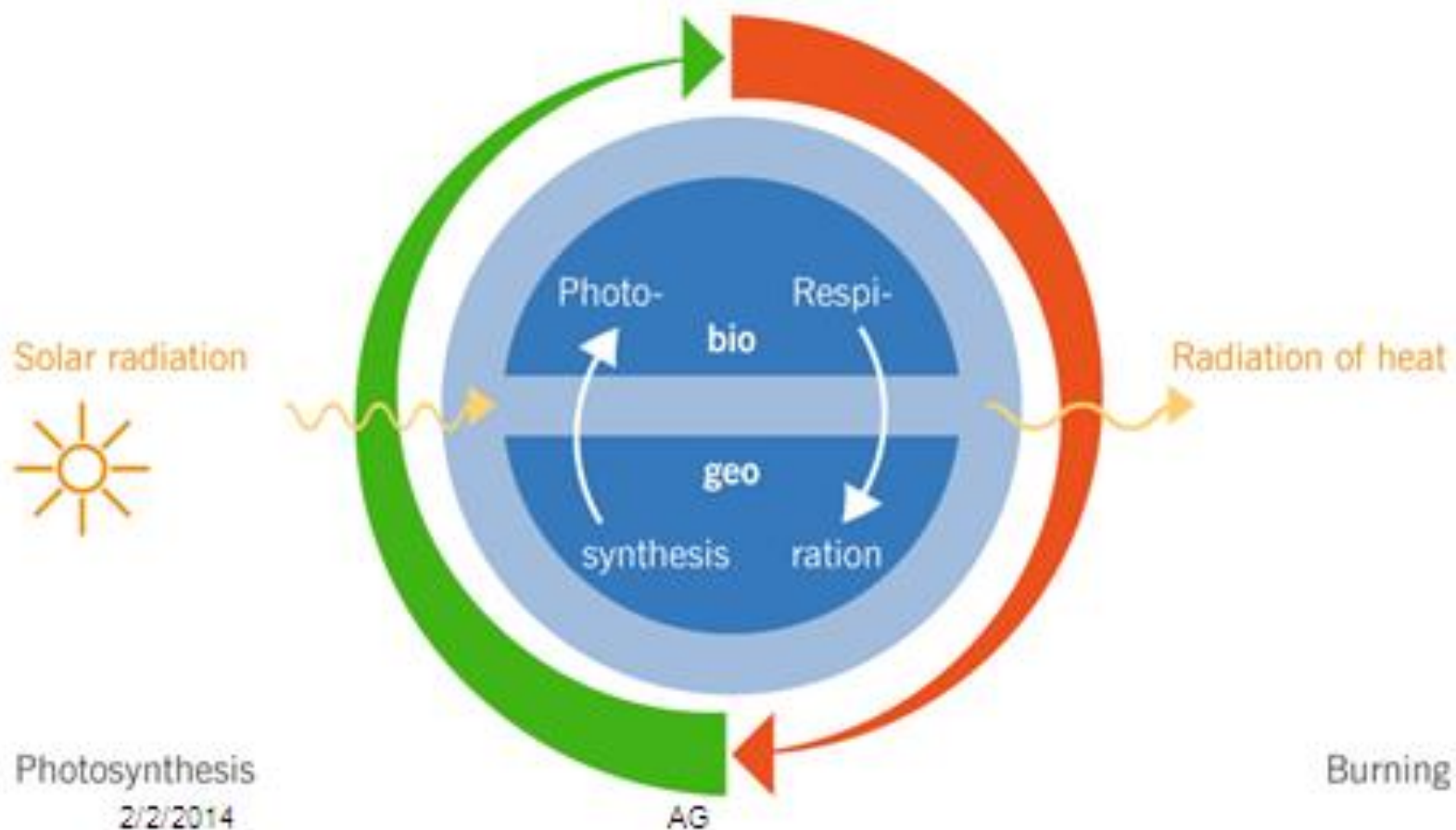
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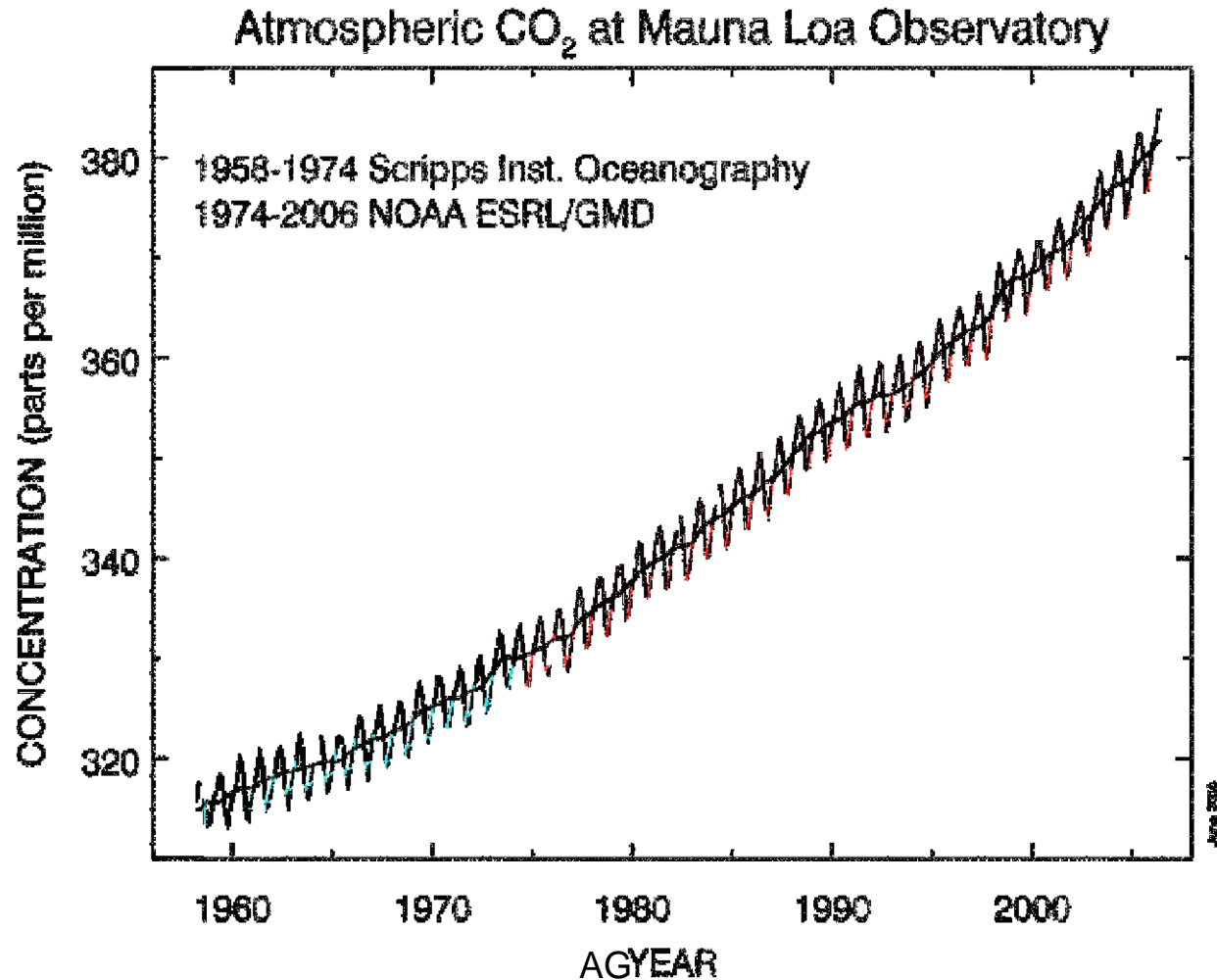
# Basic ecological conditions

energy flow, recycling and biological diversity



Ecosystem earth out of balance

Ch. D. Keeling mobilized enough resources so he could, starting 1958, measure the CO<sub>2</sub> in the atmosphere on Mauna Loa observatory in Hawaii

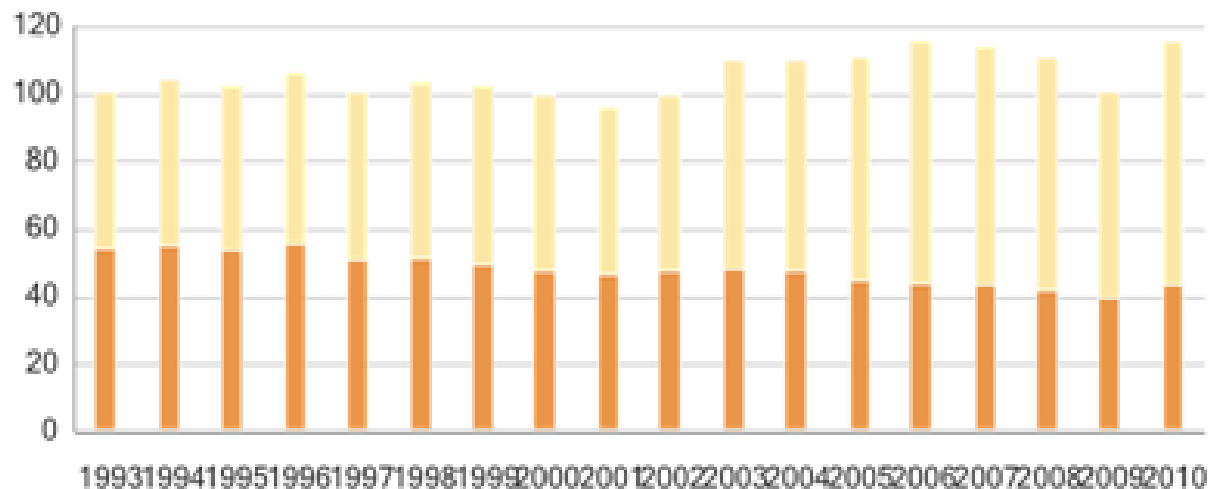


# Utsläppen orsakade av svensk konsumtion har ökat med 17 procent 1993–2011

## Utsläpp av växthusgaser från svensk konsumtion

□ Diagram

Miljoner ton koldioxidekvivalenter

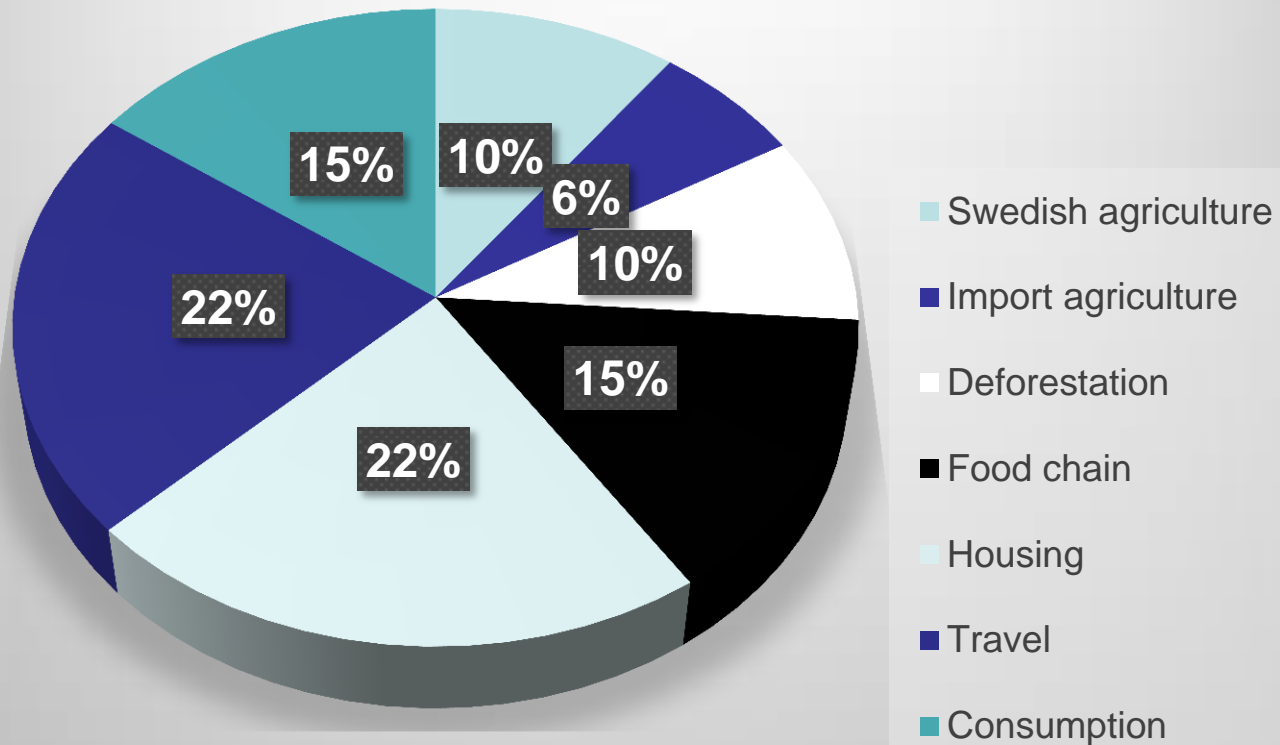


Växthusgaser - utsläpp av svensk konsumtion 1993-2010

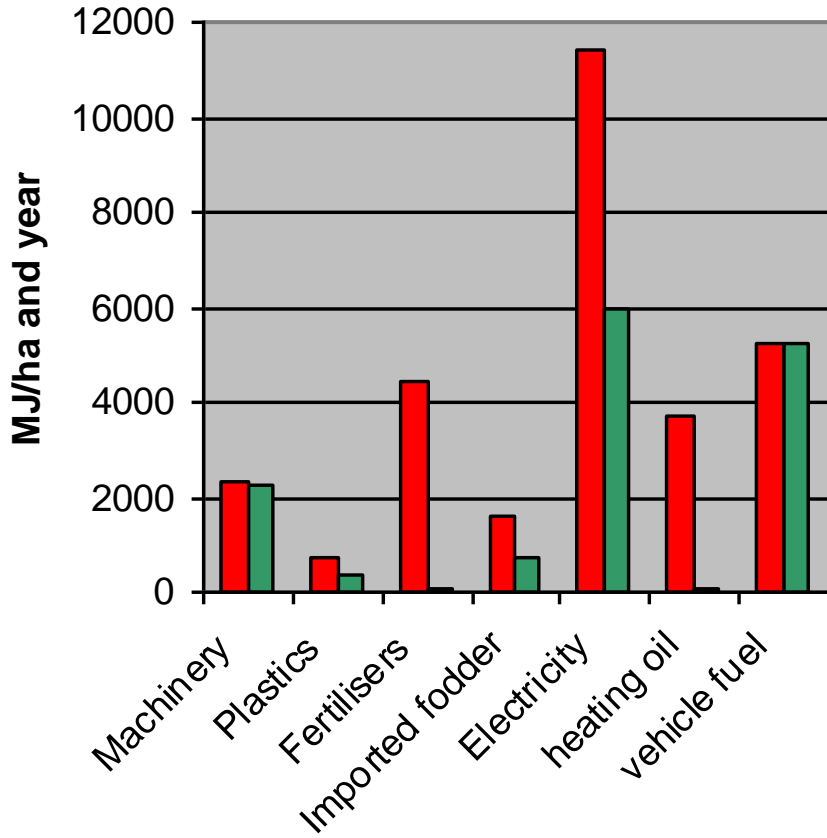
■ Utsläpp i andra länder

■ Utsläpp i Sverige

**Sw. food consumption > 40 % of global warming on  
13 t CO<sub>2</sub> eq /cap. and year**

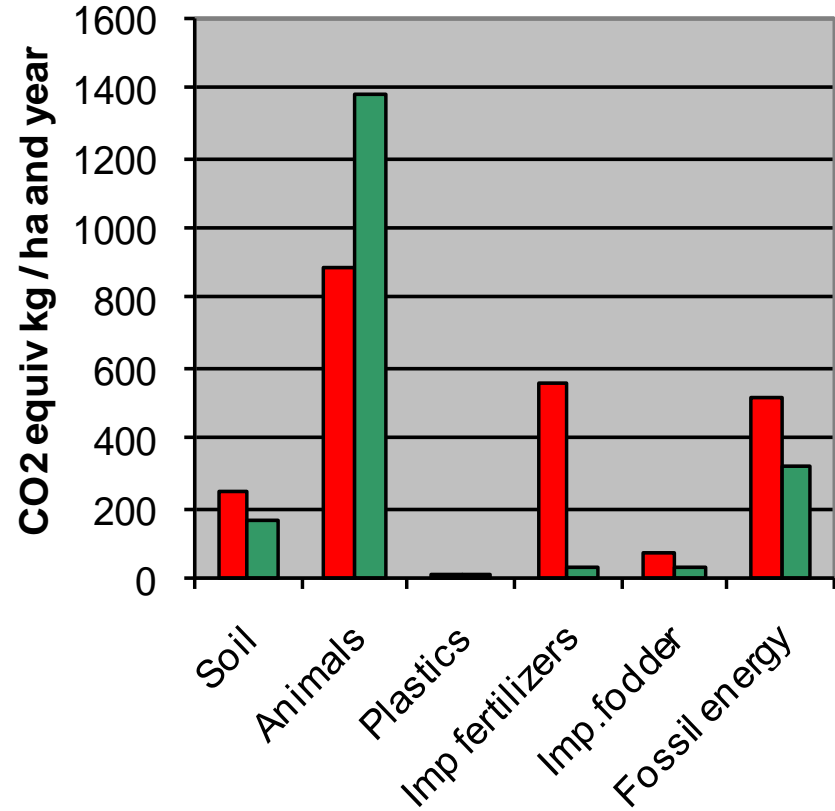


### Energy use Swedish average and BERAS farms



■ Average agriculture 29 GJ/ha ■ BERAS 15 GJ/ha

### Global warming potential Average Swedish agriculture and BERAS farms



■ Aver agric 2,1 t ■ ERA 1.8 t

# Long term manure experiment



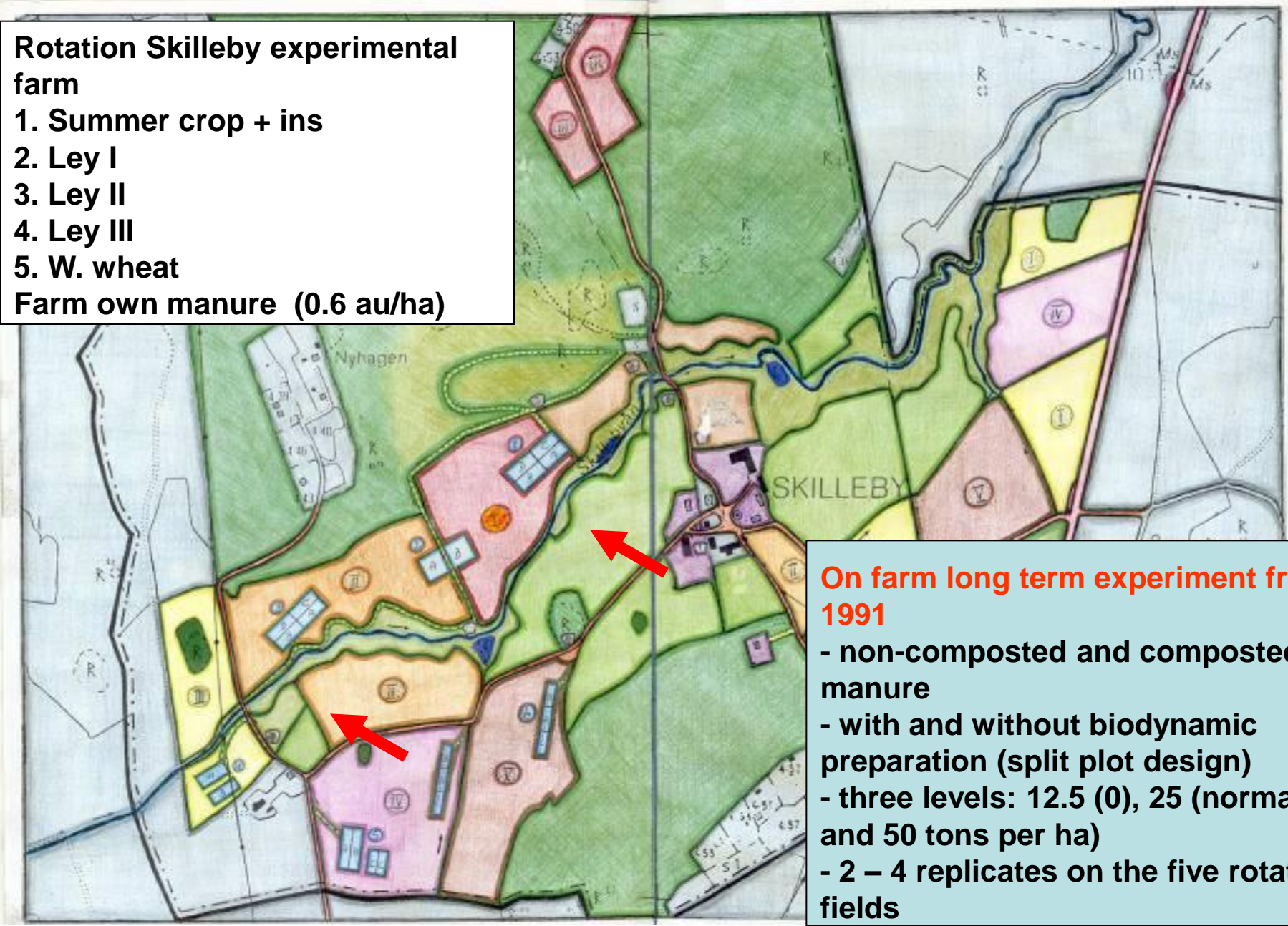
Experimental plan from 1991

Main plot	Treatments winter wheat
F1	Not composted manure 12.5 ton ( 0 from 1995)
F2	25 ton
F3	50 ton
K1	Composted manure 12.5 ton ( 0 from 1995)
K2	25 ton
K3	50 ton
Subplot (split plot) +	BD preparation each plot each year
-	Without BD preparation

## Rotation Skilleby experimental farm

1. Summer crop + ins
2. Ley I
3. Ley II
4. Ley III
5. W. wheat

Farm own manure (0.6 au/ha)

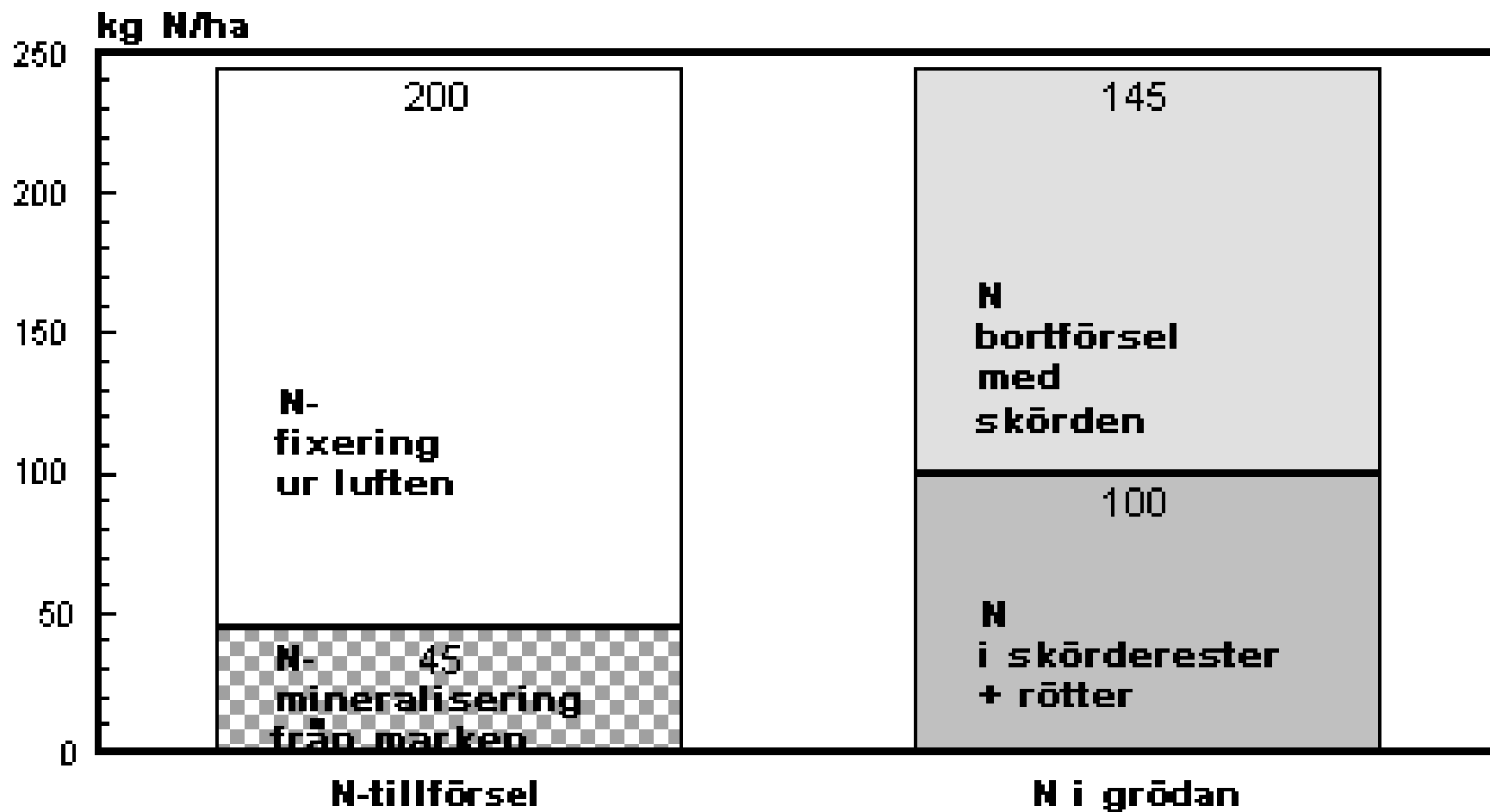


### On farm long term experiment from 1991

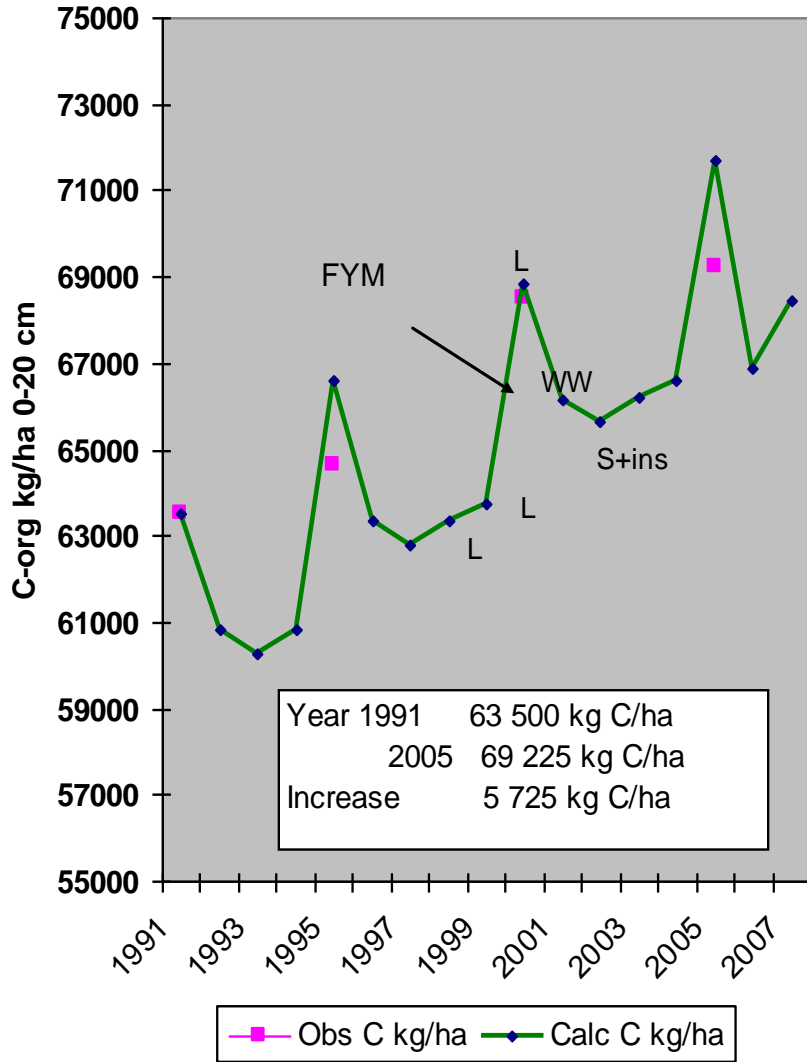
- non-composted and composted manure
- with and without biodynamic preparation (split plot design)
- three levels: 12.5 (0), 25 (normal) and 50 tons per ha)
- 2 – 4 replicates on the five rotation fields



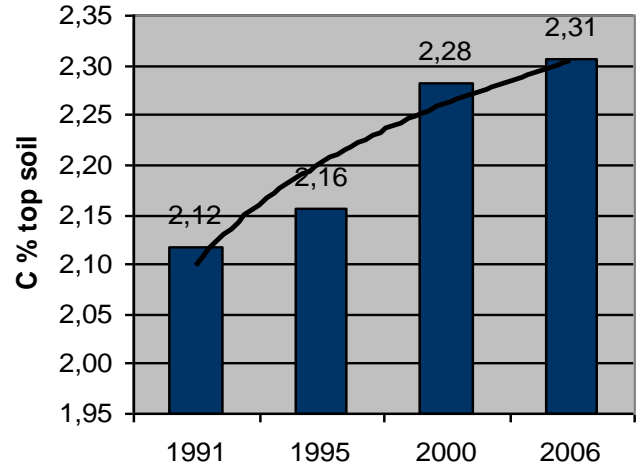




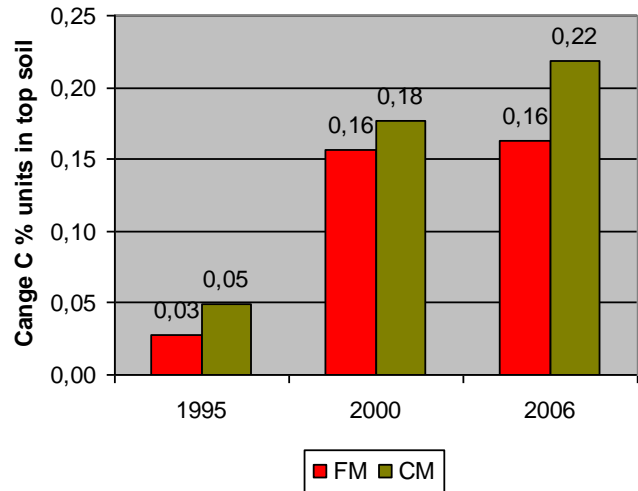
### Top soil Organic Carbon HV 1



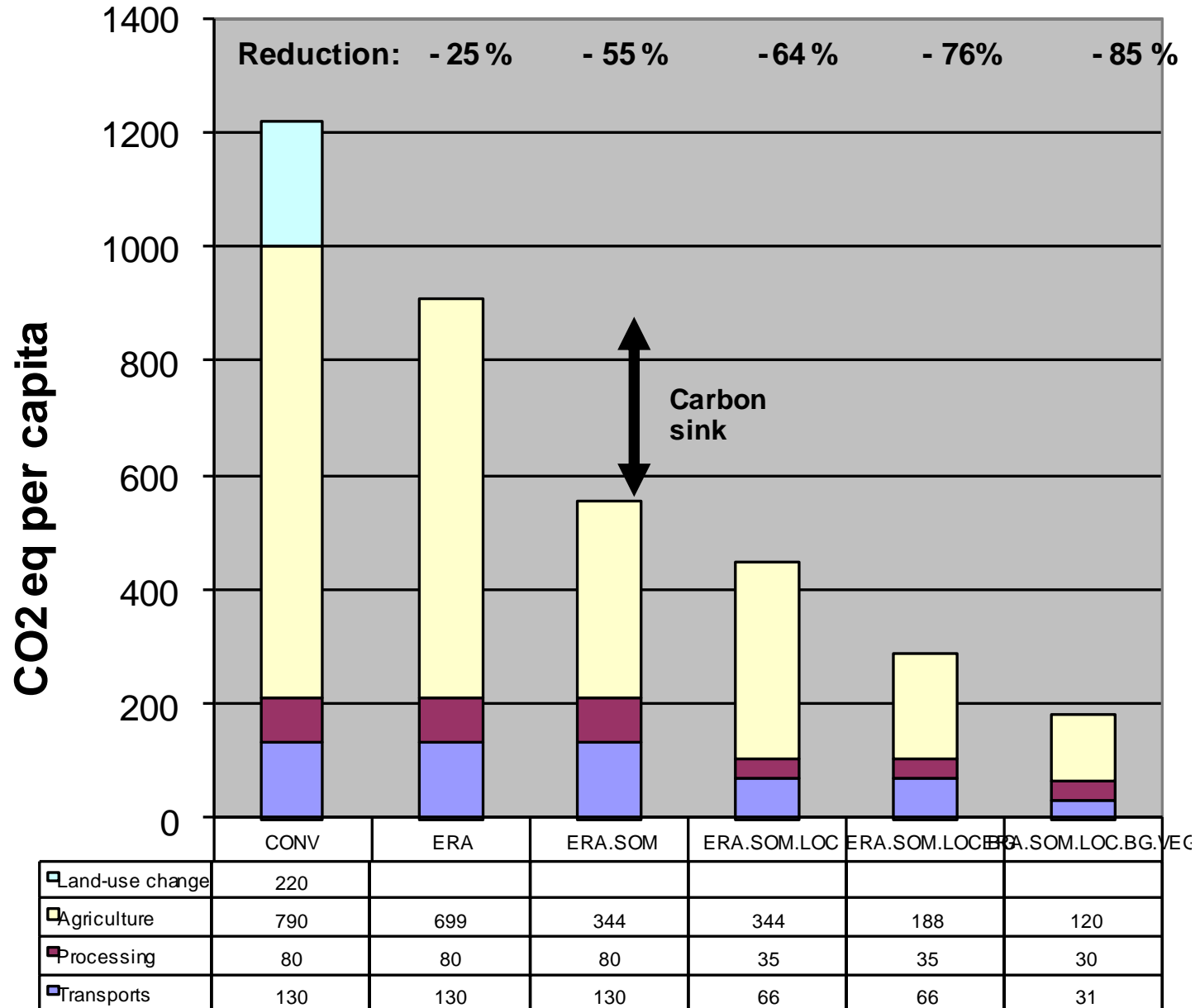
### HV I



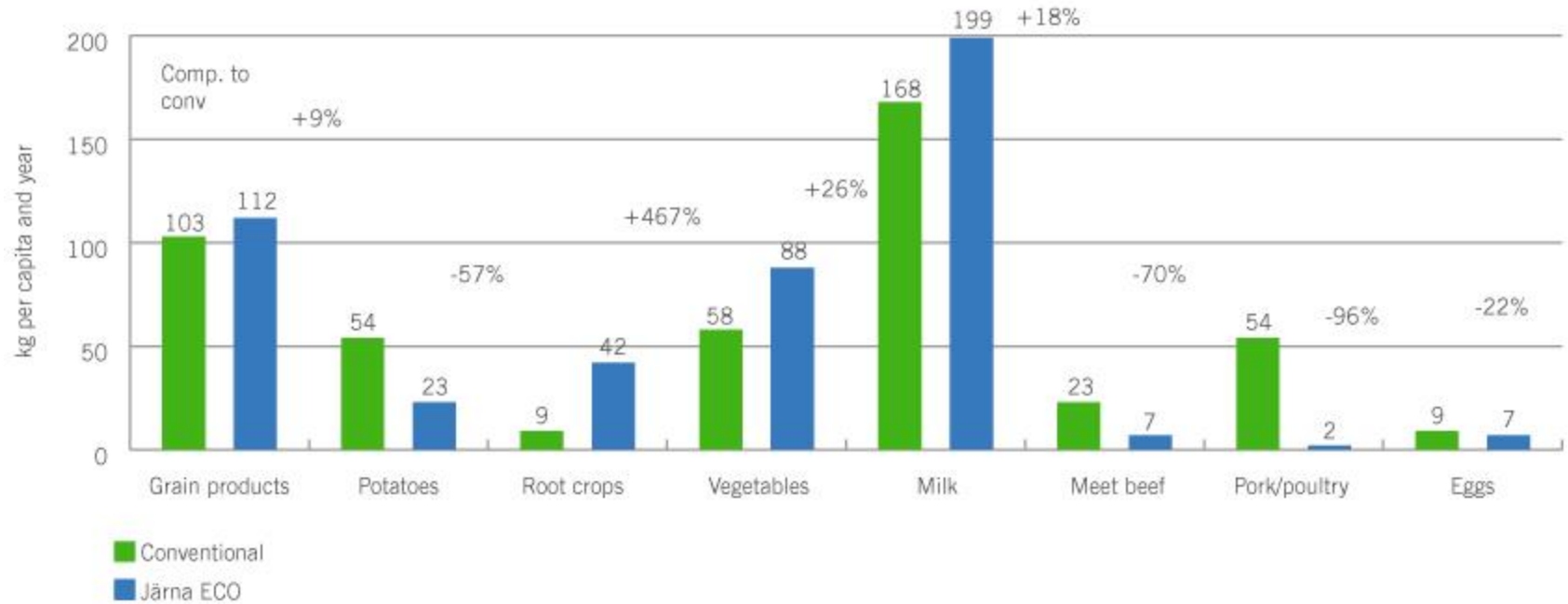
### HV I



# Basic food CO2 eq



Conventional and ecological consumption BERAS – Järna survey (Granstedt and Thomson 2005)



- **An ecological recycling agriculture based on integrated crop and animal production with effective recycling of nutrients and organic biomass and crop rotations with legume - grassland can:**
  - 1. conserve basic natural resources**
  - 2. rebuild fertile soils**
  - 3. protect the Sea from N, P and pesticides**
  - 4. reduce the global warming**
  - 5. Improve the food nutritional quality**

# K-experiment. Yield 1000 MJ/ha

