
Environmental impact of feed optimization: alternative protein sources in pig diets

Hannah van Zanten

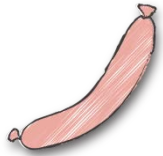
31-8-2016



Demand for Animal Source Food

Current

2050



258 million ton —————>

455 million ton (76%)



664 million ton —————>

1077 million ton (62%)

Large environmental impact!



Feeding 'leftover' the solution?

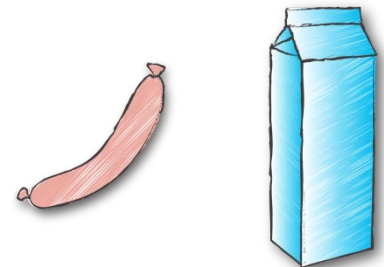
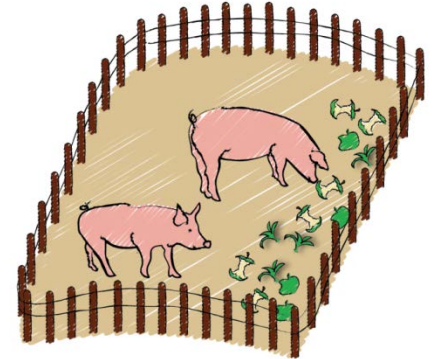
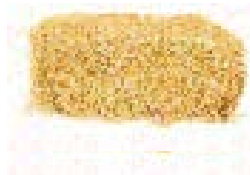
- Co-products



- Waste products



- Marginal land

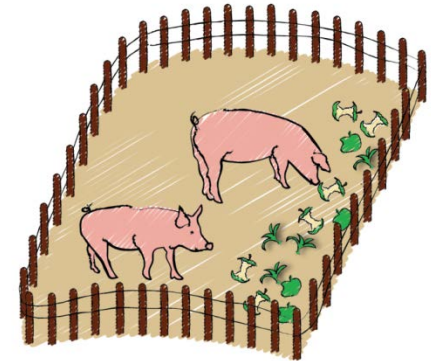


Two cases: leftovers replace soybean meal

- Co-products



Rapeseed meal
→

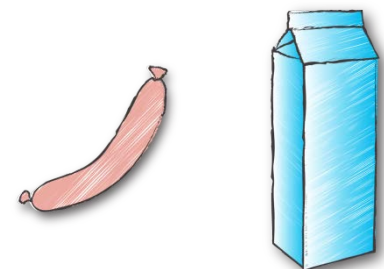


- Waste products



Waste-fed insects
→

- Marginal land



Aim

Assess environmental consequences of feed optimization, when RSM or waste-fed insects are included in growing pig diets

Problem: RSM and waste to fed insects are limited available

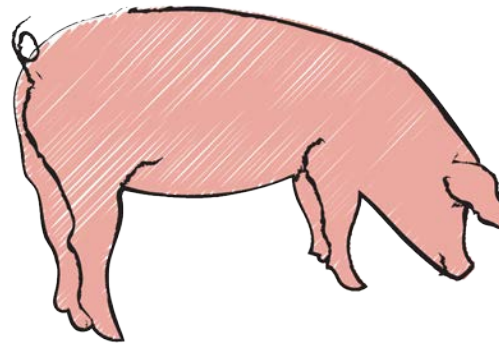


Method: life cycle assessment

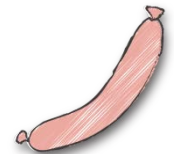
Input



System



Output



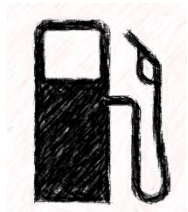
total/output =
impact per kg product

Consequences

GWP
Energy use
Land use

Considering consequences

- Amount of RSM and waste to feed insects is limited
- Food waste already used —————> bio-energy






- What are the consequences?
 - New method: framework consequential LCA
 - Current method (ALCA)

Nutrient content g/kg	SBM	RSM	Insects
Nett energy, MJ	9.5	9.5	9.5
Crude protein	162	160	166
Lysine (SID)	7.59	7.59	7.59

Final body weight	116.4	116.4	116.4
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Ingredients	SBM	RSM	Insect
Rapeseed meal, CP <380	-	23.00	-
Soybean meal, CP<480	15.00	-	-
Larvae meal	-	-	15.00
Peas	9.36	10.00	-
Maize	30.00	30.00	30.00
Wheat	29.74	30.24	24.29
Wheat middlings	0.90	-	26.57
Barley	10.10	-	-
Sugarcane molasses	2.00	2.00	2.00
Vit. and min. premix	0.40	0.40	0.40
Phytase premix	0.65	0.65	0.65
Animal fat	-	2.09	-
Limestone	1.24	0.96	1.10
Salt	0.37	0.29	0.26
Monocalcium phosphate	0.11	0.01	-
Sodium bicarbonaat	-	0.09	0.15
L-Lysine HCL	0.10	0.22	0.03
L-Tryptophan	-	0.01	-
L-Threonine	-	0.02	-
DL-Methionine	0.03	0.01	-

Assess environmental impact

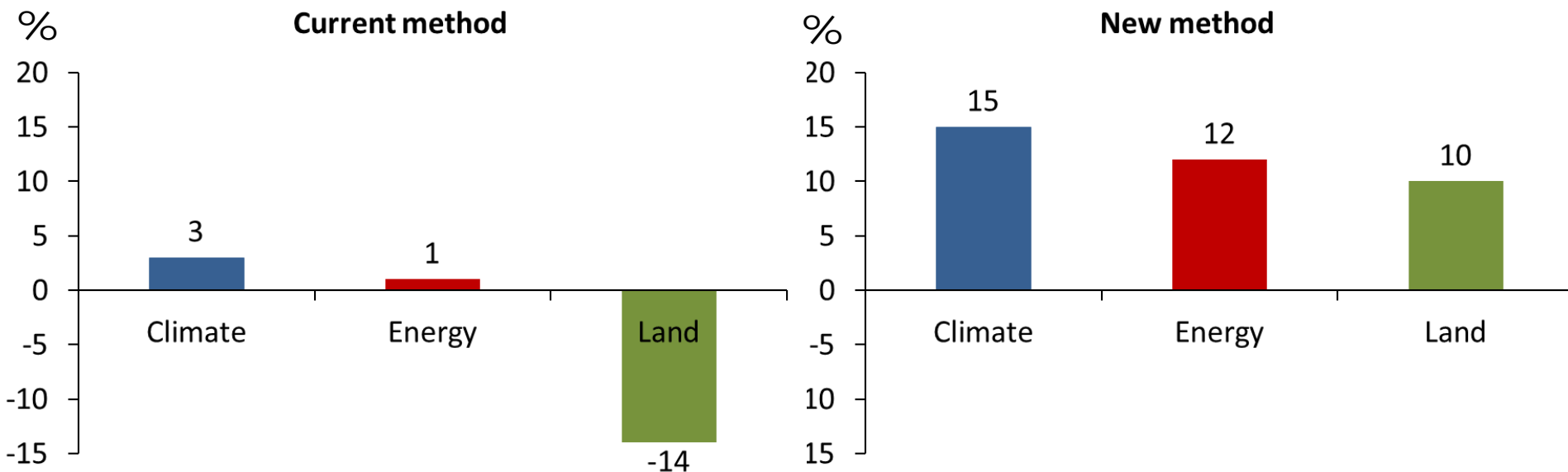
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Current method: sums up impact

New method:
1) identify leftovers
2) identify consequences

Results

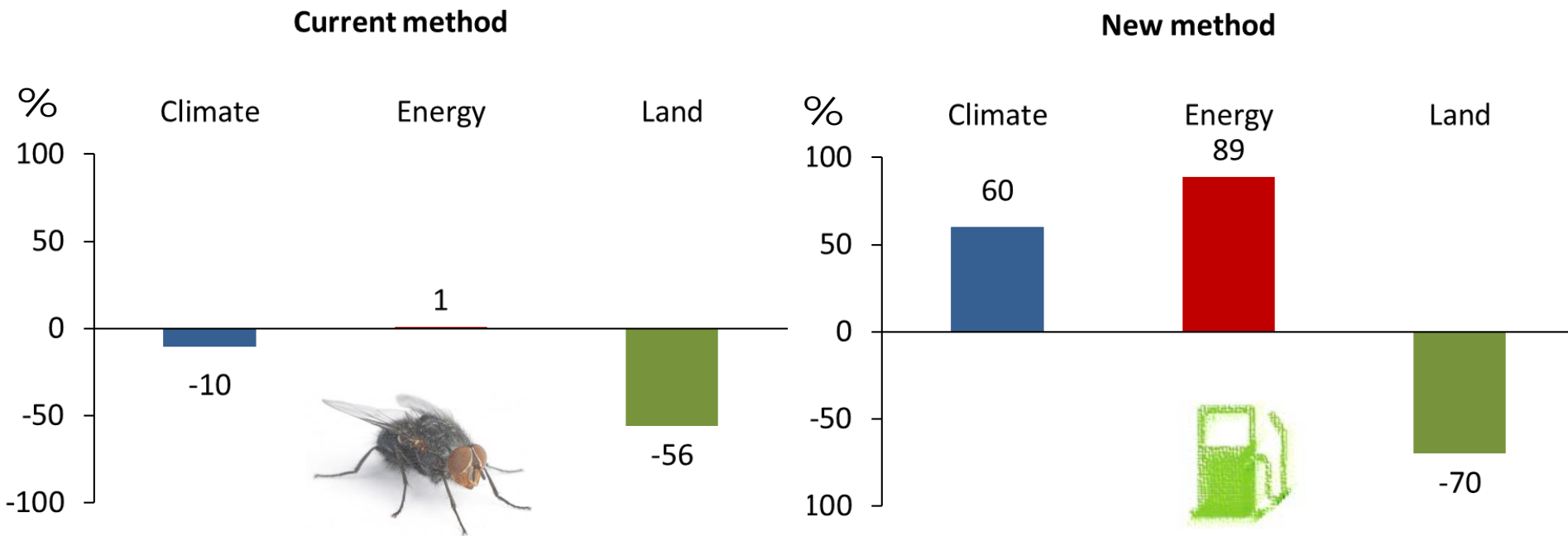
Environmental impact of replacing SBM with RSM in pig diets



Conclusion: - large methodological differences
- no environmental improvement

Results

Environmental impact of replacing SBM with waste-fed insects



Conclusion: - large methodological differences
- environmental improvement?

Recommendation

- Status quo of feed —————> use current method
- Implementing innovation —————> use new method



Thank you

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