Mitigation of enteric methane for French cattle: potential extent and cost of selected actions

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The statement

Livestock sector accounts for 14.5% of anthropogenic greenhouse gases (GHG) emissions (FAO, 2013)

Public policies aim to decrease GHG emissions

Scientific community works at finding ways for GHG mitigation

How to bridge the gap between scientists and policy makers ?

→ **Determine the best available and applicable mitigation techniques**

→ **Determine the extent of abatement and the cost**

The French government order

Propose 10 mitigation actions for French agriculture, evaluate effectiveness, calculate abatement extent and cost from now on until 2030

This presentation: action for decreasing enteric methane (> 50% GHG)

Constraints

→ No change in production
No adverse effects on other sustainability issues

→ No significant changes in farming systems but changes in practices
i.e. not business-as-usual ~~genetic merit~~

→ Proof of effectiveness, availability at present ~~vaccination~~
Acceptability by farmers and citizens ~~ionophores~~

Selected actions and methodology

Dietary fats (unsaturated)
Nitrates as dietary additives

Guyader et al., 2014

Fats

Extruded linseed and rapeseed
3.5% additional fat
for a 14% methane abatement
All cattle receiving concentrates

Replacement of cereals and meals
Rapid adoption

Nitrates

1% in the diet for a 10% methane abatement
Only for cattle fed diets low in fermentable N (maize silage-based)

Replacement of other fermentable N sources (urea)
Slow and incomplete adoption

Abatement extent (t CO_2-eq/yr) calculated from:

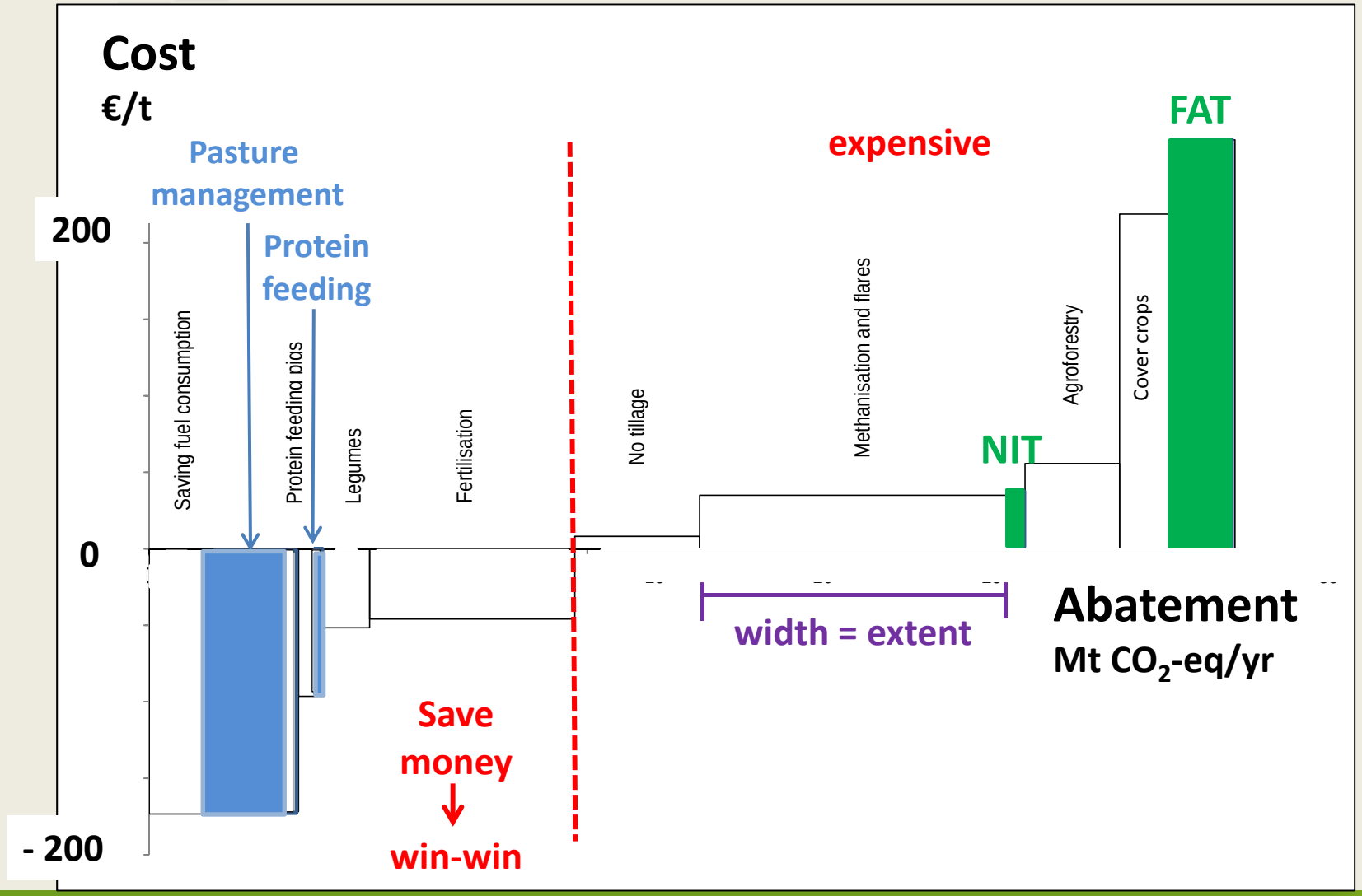
Number of animals / yr
kg of nitrate / animal
abatement / kg nitrate

Abatement and cost

	FAT	NIT
Abatement potential (Mt CO_2-eq)	27.0	4.5
Total cost for farmers (M€)	7209	170
Cost per t CO_2-eq avoided	267	38

High sensitivity to hypotheses for unitary emissions (per cow)
for prices

Marginal abatement cost curve :
FAT & NIT among all actions for agricultural GHG



Concluding remarks

- Selection of options depends on initial constraints
- A significant methane abatement is possible now but may need incentives for application by farmers
- Other options may be possible in a near future

Decisive role of policy makers

THANK YOU FOR YOUR ATTENTION

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