

Environmental assessment of layer-type male chicks breeding



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Context

Due to ethical concerns, French legislation prohibited the culling of layer-type male chicks after hatching. In order to deal with this prohibition, two alternatives are investigated in this study *i)* breeding layer-type male chicks ; *ii)* breeding males from a dual-purpose breed, selected for balanced performances in meat and egg productions. Since the genetic selection of current poultry breeds has led to a negative correlation between meat and egg production performances, layer-type male or male from dual-purpose breeds have variable growth performances and a different environmental impact.

Material & methods

A trial was conducted to evaluate the technical performances of males breeding of two layer-lines (Brown and White), a dual-purpose line (Dual) and a slow growth line (JA) as control. These four genetics are bred in two products: cockerel and chicken, with different live weight (LW) objectives.

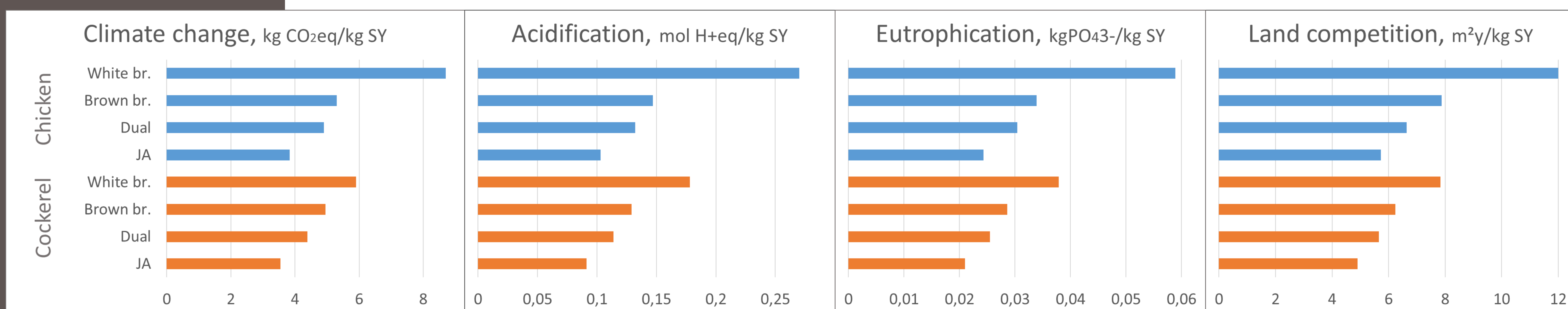
The environmental impacts of the 8 scenarios are assessed with LCA method. The functional unit is kg of carcass weight. The indicators assessed are climate change, land use, acidification, and eutrophication.

Product	Genetic	Age (d)	FCR	LW (kg)	Slaughter yield (%)
Cockerel	JA	42	2.066	0.998	62.8
	Dual	42	2.101	0.931	59.1
	Brown	51	2.321	0.831	57.3
	White	74	3.264	1.183	59.4
Chicken	JA	77	2.672	2.294	66.6
	Dual	77	2.838	2.094	63.3
	Brown	93	3.318	1.948	61.4
	White	130	5.267	1.865	63.4

Objective

This study aimed to assess the environmental impact of male chicks breeding, using life cycle assessment (LCA) method from cradle to slaughterhouse.

Results & discussion



Impact categories for the eight scenarios: Climate change, Acidification, Eutrophication potential and Land competition

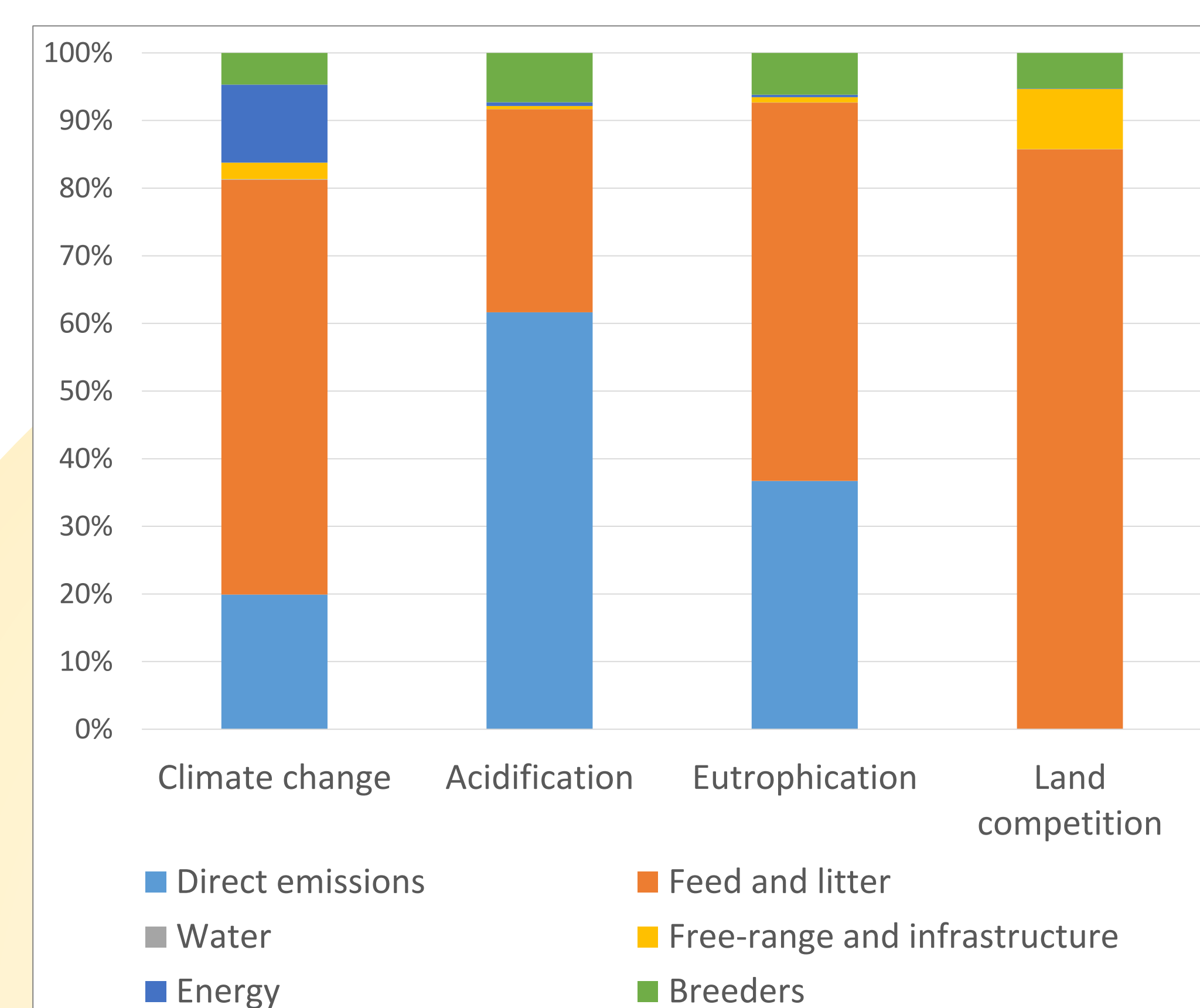
Funders



Partners



- Climate change, acidification, eutrophication potential and land use competition are following the same evolution between the different scenarios
- White meats has the greatest impacts. These impacts are consistent with their low breeding performances, associated with a long breeding period and high FCR
- Brown meats are associated with mitigated environmental performances
- The Dual meat moderate impacts reflect the close breeding performances to JA meat
- Feed Conversion Ratio (FCR) plays a great role in the impact
- Energy represents the second contributor to impact indicators



Main contributors to the impact categories

Conclusion

The impacts of meat from layer-type males is greater than Dual and JA meat impacts.

However, if Dual-type lines were used for meat production and egg production, there should be investigation about their laying technical and environmental performances.

Another alternative to layer-line male crushing is in-ovo sexing, allowing the selection of sex directly in the egg. This alternative would not imply breeding of layer-type or Dual males.