Influence of overfeeding duration and intensity on health and behavioural indicators measured in ducks

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Background

Overfeeding for foie gras production is regularly called into question. Thus it seems essential to evaluate animal condition to adopt an approach of controlled and shared progress. To this end, we worked to develop a simple and objective multi-criteria method for **assessing the status of birds during overfeeding**. This involves proposing indicators in the different dimensions of welfare and **testing their validity**.

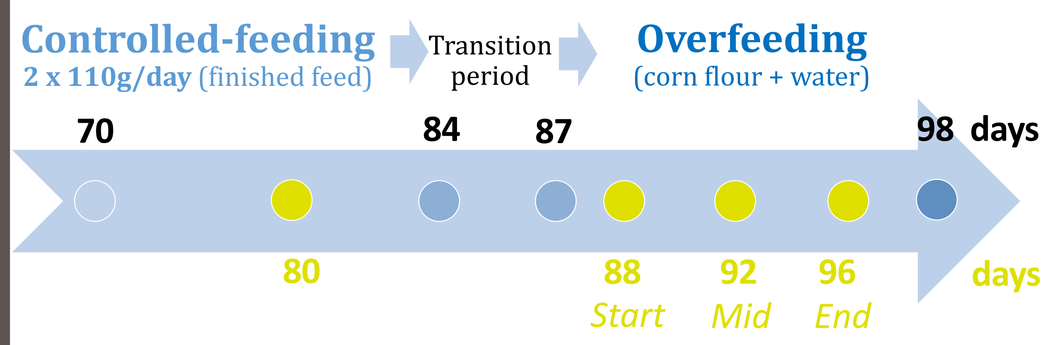
Objective

The purpose of the study was to measure the impact of overfeeding intensity and duration on various health and behavioural indicators. Verifying the **sensitivity of indicators** is indeed one of the steps in their validation.

Method

Animals, feed and experimental groups

n = 320 male mule ducks, distributed into 80 pens (4 ducks/pen)



2 Overfeeding intensities:
- MI (Moderate intensity ; n = 160)
- HI (High intensity ; n = 160)

4 Times of measurements:
80, 88, 92 and 96 days

Health and behavioural indicators measured

Principles assessed	*Health*	*Behaviour*
Good feeding	Small size Feed stain	Drinking
Good housing	Dead - Dirty body Prone - Body	Lying - Scratching Resting - Panting
Good heath	lesion - Blood stain - Dirty eyes	Positive interaction Negative interaction
Appropriate behaviour	Wet aspect - Leg lesion Feather loss - Lame Ruffled	Preening - Tail shaking - Exploring Stretching Snorting - Active Gaping - Motionless

Each indicator was noted as **present (1) or absent (0)** for each animal in the pen, by an observer circulating among the pens

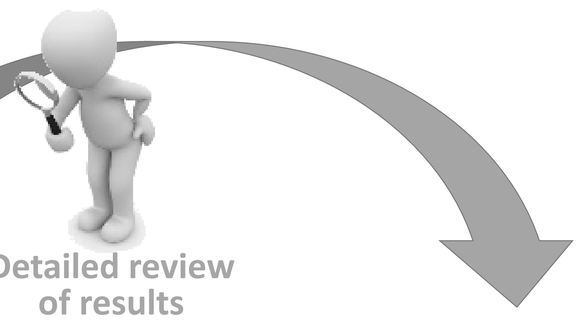
Deliverables

Sensitivity of indicators (statistical analysis using GLMM for binomial data)

13/25 indicators analysed impacted by overfeeding intensity and/or duration... and therefore **sensitive to practices or time of measurement**

Principle	Indicator	P1	P2	P3
Good feeding	Feed stain	**	***	†
	Driking	*	*	ns
Good housing	Lying	**	***	ns
	Resting	***	***	***
	Panting	ns	***	**
Good heath	Dirty eyes	ns	***	ns
	Wet aspect	ns	***	ns
	Leg lesion	ns	***	ns
	Blood stain	ns	***	ns
Appropriate behaviour	Preening	ns	**	ns
	Active	**	*	†
	Motionless	ns	***	**
	Ruffled	ns	***	*

*P1: P time of measurements; P2: P overfeeding intensity; P3: P interaction - *** : P < 0.001; ** : P < 0.01; * : P < 0.05; † : P < 0.1; ns : P > 0.1*



3/13 would require further validation, considering the variations observed

Recommendations for indicators

Principle	Indicator	Time of meas. (Start · Mid · End of Overfeeding)	Reference value
Good feeding	Feed stain		☺ Max. threshold to be set
	Driking		☺ Min. threshold ≈ 10%
Good housing	Lying		
	Resting		☺ Min. threshold to be set
	Panting		☺ Max. threshold ≈ 20%
Good heath	Dirty eyes		☺ Max. threshold to be set
	Wet aspect		
	Leg lesion		☺ Max. threshold to be set
	Blood stain		☺ Max. threshold to be set
Appropriate behaviour	Preening		☺ Min. threshold to be set
	Active		
	Motionless		☺ Max. threshold ≈ 20%
	Ruffled		☺ Max. threshold ≈ 40%

Conclusion

Our resultats suggest that **10 indicators are sensitive to practices and animal status and could thus be used for on-farm evaluation** (Feed Stain, Drinking, Resting, Panting, Dirty eyes, Leg lesion, Blood stain, Preening, Motionless and Ruffled*)*.

Perspectives: determine (i) the robustness of the indicator evaluation (iii) recommendations for the best time of mesurment (ii) baseline values

Financing

Partners

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