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Research Institute of Organic Agriculture
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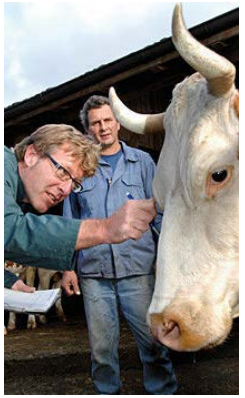



Performance of male layer hybrids fed different dietary protein sources as fattening cockerels

S. Ammer, N. Quander, I. D. M. Gangnat, V. Maurer and F. Leiber

Background

› High intensification in the poultry production

→ specialized hybrids with high efficiency in onesided purpose

→ laying performance vs. meat production

→ no efficient use for male chicken of layer hybrids

› 2.5 billion one-day-old male layer hybrids culled worldwide per year

→ increasingly critizised from society, politics, etc. as an unethical practice (Bruijnis et al., 2015)

→ e.g. prohibition of culling until end of 2017 in parts of Germany

→ Need for alternatives avoiding culling

Background

- Mainly discussed alternatives:
  - → sex determination *in–ovo*
  - → breed of dual-purpose chicken
  - → fattening of male layer hybrids discussed as one problem-solving opportunity

- Inefficient and uneconomic fattening performance of male layer hybrids (e.g. Kaufmann and Andersson, 2015)

- Fattening chicken fed with valuable protein sources as soybean – expensive import and negative ecological effects
  - → use of more extensive feed – solution for male layer hybrids?

Objectives

- Comparison of fattening performance and meat quality between two layer hybrids and a common organic fattening strain,
- Investigation of a more extensive protein source with lower dietary protein content.

Estimation of:

- Effects of genotype,
- Effects of dietary crude protein content,
- Interaction of genotype and dietary treatment.

Materials and methods

- Dec 2014- Mar 2015;
- 270 one day old chicken

Animals

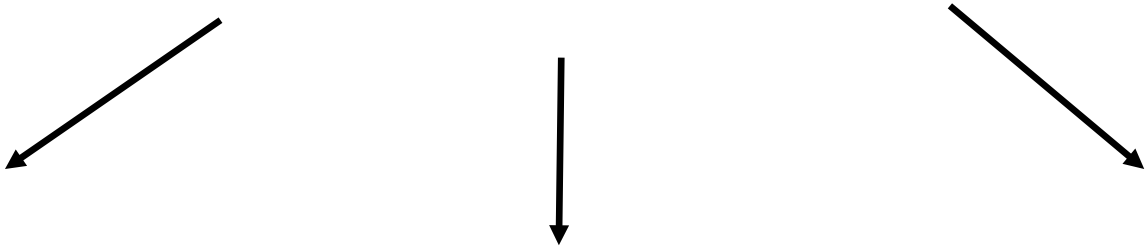
- **Mixed-sex fattening chicken**
  - 90 Hubbard JA-757 (**HUB,** organic);

- **Male layer hybrids**
  - 90 Lohmann Brown (**LB**);
  - 90 Lohmann Selected Leghorn (**LSL**);

→ Each genotype: 3 treatment-groups with 30 chicken/treatment

Dietary treatments

Commercial organic fattening diet
25.5 % soybean cake



Control feed
(**CF**)

+ Alfalfa meal *ad lib.*
(**Alf-ext**)

12 % of soybean cake
replaced by alfalfa meal
(**Alf-int**)

Nutritional composition

Item	CF	Alfalfa-meal	Alf-int
Dry matter (%)	89.65	91.2	89.1
Crude protein (g/kg)	200	165	173
Lysin (g/kg)	9.3	6.1	7.8
Methionin (g/kg)	3.9	2.8	3.3
Energy (MJ/kg)	12.2	6.06	11.4

Data recording and analysis

Group based:

- Feed consumption

Animal based:

- Weight gain
- Liveweight
- Physical and chemical meat quality parameters

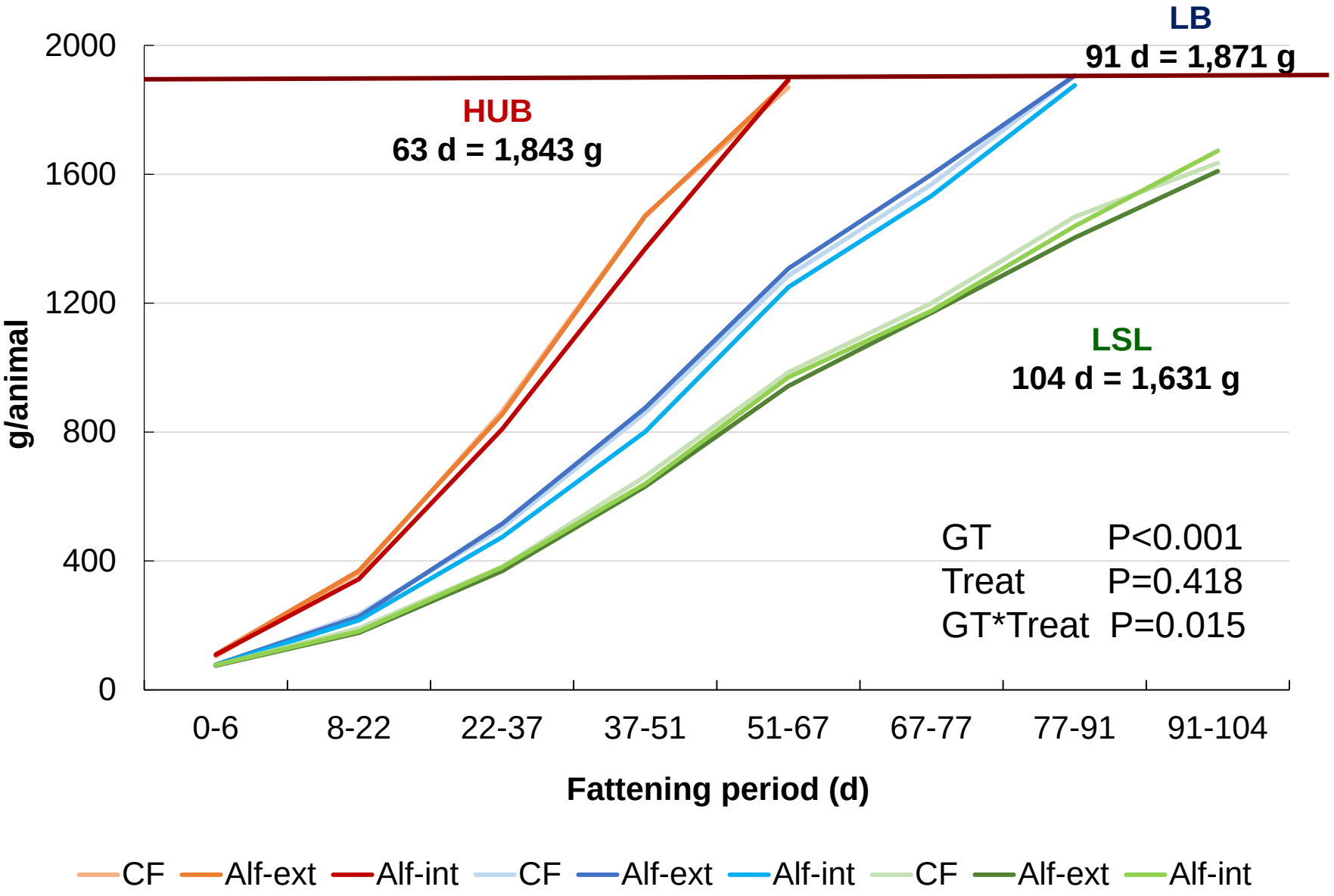
- Fattening periods per GT were defined based on the liveweight of HUB after 63 d

- Univariate variance analysis: fixed effects of genotype and dietary treatments, interactions

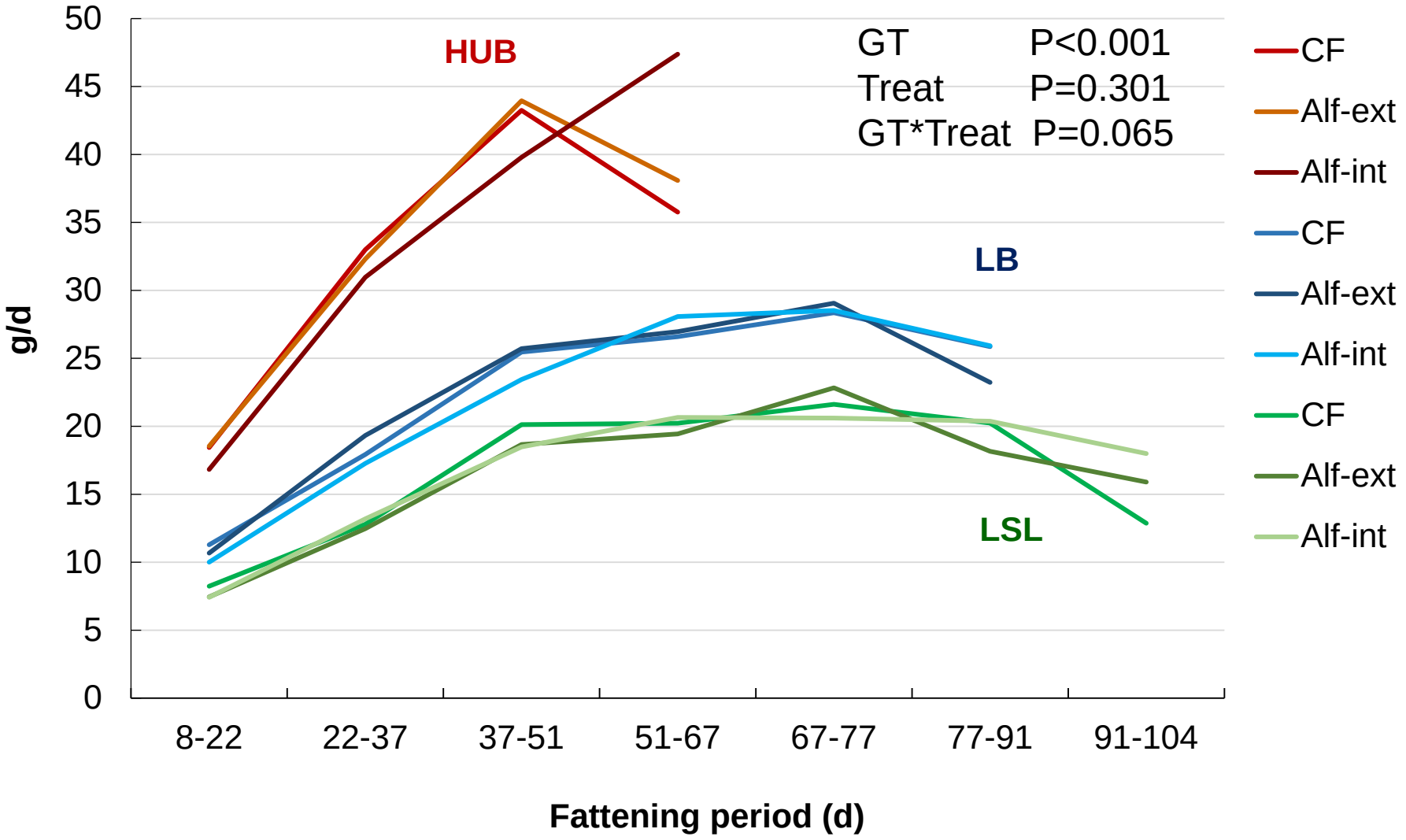
(SPSS, Version 20.0)

Results

Growth rate – by genotype and dietary treatment



Daily weight gain



Slaughter performance and meat cuts

Item	HUB	LB	LSL	SEM	P-Value		
					GT	Feeding	GT*Feed
Carcass weight (g)	1,191[a]	1,148[b]	957[c]	14.1	<0.001	0.609	0.629
Slaughter yield (%)	64.6[a]	61.3[b]	58.7[c]	0.00	<0.001	<0.001	0.358
Breast cut							
Weight, (g)	346[a]	281[b]	282[b]	4.66	<0.001	0.237	0.668
Proportion, (%)	29.1[a]	24.5[b]	29.4[a]	0.00	<0.001	0.247	0.248
Leg cut							
Weight, (g)	361[a]	373[a]	303[b]	6.05	<0.001	0.677	0.735
Proportion, (%)	30.3[a]	32.6[b]	31.7[b]	0.00	<0.001	0.974	0.815

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Feed consumption

	HUB			LB			LSL		
	CF	Alf-ext	Alf-int	CF	Alf-ext	Alf-int	CF	Alf-ext	Alf-int
Total/group (kg)	144	150	159	236	269	234	259	295	251
kg feed/ kg carcass weight	4.03	4.20	4.50	6.81	7.85	6.85	9.00	10.53	8.60
kg feed/ kg liveweight	2.51	2.66	2.74	4.14	4.55	4.03	5.29	6.11	4.85

Meat quality

Item	HUB	LB	LSL	SEM	P-Value		
					GT	Feeding	GT*Feed
Max. shear force (N)	14.2[a]	16.1[b]	13.8[a]	0.56	<0.001	0.628	0.405
Crude protein (%)	26.5[a]	25.8[b]	26.2[ab]	0.13	0.010	0.016	<0.001
Crude fat (%)	2.18[a]	2.32[a]	1.44[b]	0.17	<0.001	0.038	<0.001

Conclusions

- Discussions on the culling of one-day old male layer hybrids require an alternative.
- Less efficient fattening performance of male layer hybrids
  - LB reached a similar liveweight after 91 d
  - Longer fattening period and higher feed consumption
- Minor influences of the dietary treatments offer opportunities
  - Lower protein contents with reduced soybean may at least partly compensate the lower efficiency
- But: remains open, if the fattening of male layer hybrids offers a solution to completely abolish chicken culling

Thank you for your attention!

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