CJ Products
L-Arginine

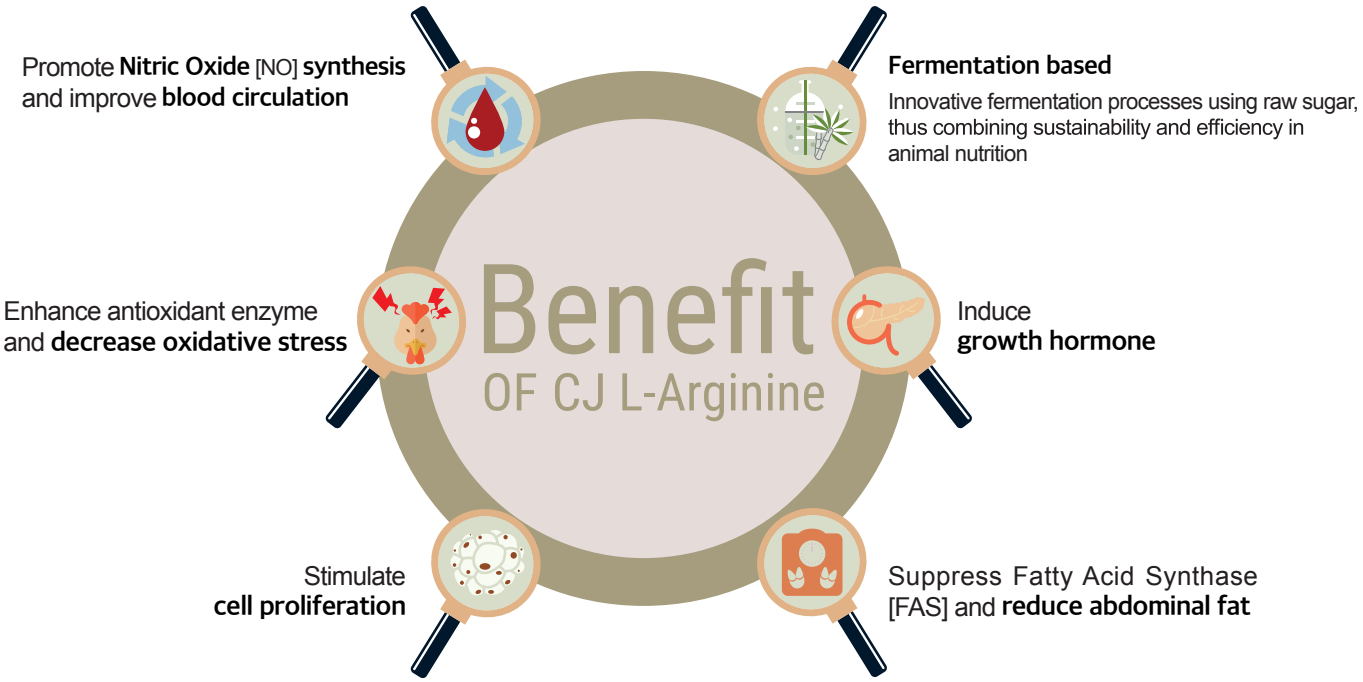
Introduction

Trial report

- L-Arginine requirements for growth and carcass parameters in broilers

- Influence of a consistent arginine supply in complete diets with varying protein contents on performance and N-utilization in broilers

Introduction



Main functions of L-Arginine in livestock

Poultry

Broilers

- Suppress hepatic Fatty Acid Synthase (FAS)
- Enhance CPT1 and 3HADH which are enzymes related to transferring fat into energy

Abdominal Fat ↓ Carcass Yield ↑ Breast Meat Yield ↑

Layers

- Increase **antioxidant capacity** and decrease oxidative stress which is caused by heat / cold stress
- **NO** induces vasodilation, and better blood circulation improves reproductive organs

Stress ↓ Mortality Rate ↓ **Egg Production** ↑

Swine

Sows

- Arg is common substrate for NO and polyamine synthesis : Key regulators of embryogenesis, placental and fetal growth.

Pregnancy Outcome ↑ **Improves the number of live-born piglets**

Piglets

- Induce growth hormone
- Creatine and polyamine synthesis, enhances cell proliferation

Growth Performance ↑

Aqua

Salmon

- Promote lipid metabolism which reduces adipose mass

Farmed Salmon Fat Portion ↓

- Polyamine promotes embryo development

Reproduction Performance ↑

CJ Trial report

L-Arginine requirements for growth and carcass parameters in broilers

Objective

The objective of the present study was to determine the optimal Arg requirement of the genetically upgraded broilers through supplementation technique

Materials and Methods

- **Animals** : 0-28d 1,440 ROSS308 broilers (6 treatments X 8 replicates X 30 birds/pen)

Treatment

Treatment	1	2	3	4	5	6
Arg:Lys	77%	85%	95%	105%	115%	125%
Note	Basal			Ross		

Parameters : Body weight, average feed conversion ratio, and abdominal fat weight

Results

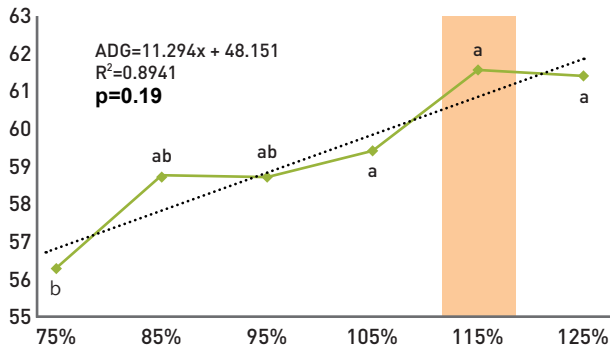


Fig. 1. ADG (Average Daily Gain),g/d

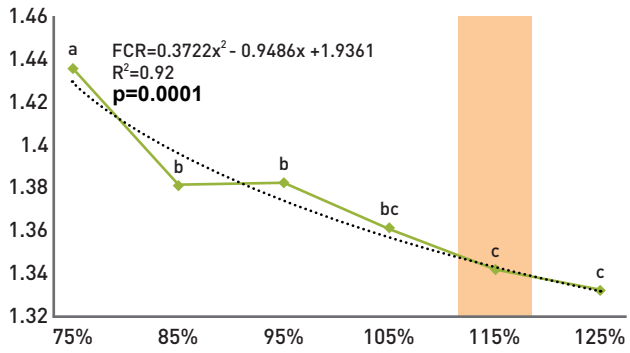


Fig. 2. FCR (Feed Conversion Ratio),F/G

The requirement for weight gain and FCR was considered optimal at Arg:Lys of 115%.

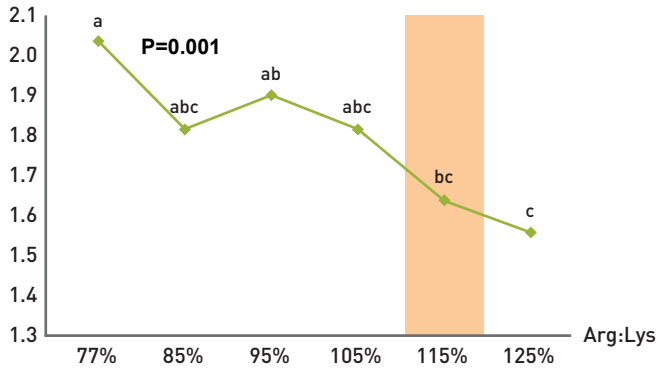


Fig. 3. Percent Abdominal fat,%

Arg supplementation tends to reduce abdominal fat as a percentage of body weight.

Conclusion

The Arg:Lys requierments can be 115%, which is higher than standard recommendations (105%).
Nowadays, Arg:Lys=105% can be considered quite low for modern and genetically upgraded chickens.

CJ Trial report

Influence of a consistent arginine supply in complete diets with varying protein contents on performance and N-utilization in broilers

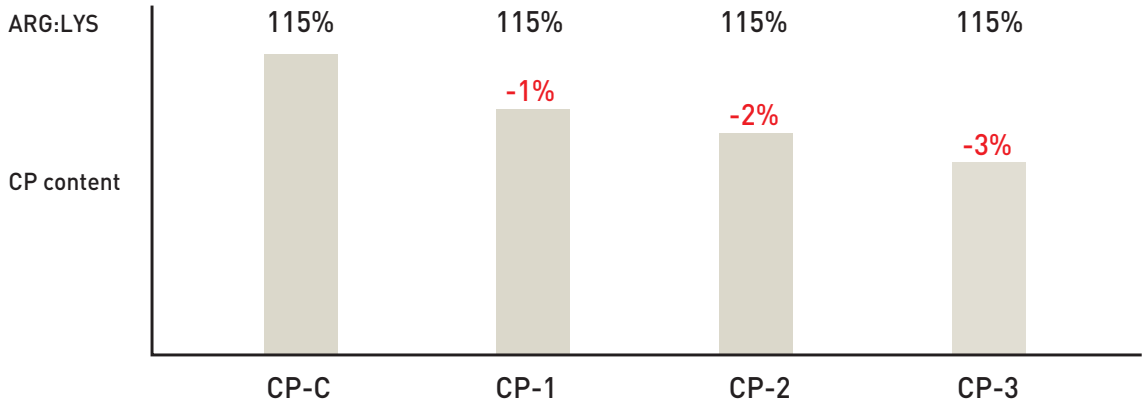
Source : Sustainability 2018, 10, 3827; doi:10.3390/su10113827

Objective

Effects of step-wise reduced crude protein (CP) content for broilers on performance, health and N-excretion (balanced for essential amino acids and a constant arginine-lysine ratio)

Materials and Methods

- Experimental animals : 360 ROSS308 broilers (4 treatments X 6 replicates X 15 birds/replicate)
- Research laboratory : University of Veterinary Medicine Hannover, Germany
- Performance parameters : Body weight, Dry matter content and nitrogen in feces, Dry matter content and nitrogen in litter
- Trial design **(Starter : d 1-7, Grower : d 8-14, Finisher : d 15-35)**

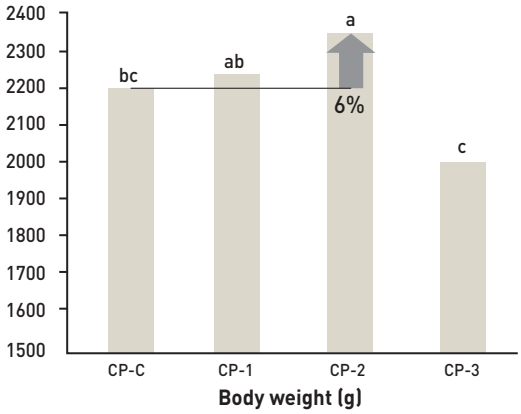


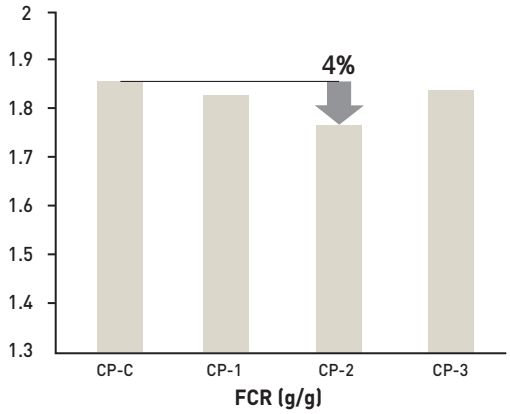
CP-C CP content: Starter 21.5%, Grower 20.5%, Finisher 20.0%

Results

· Growth Performance

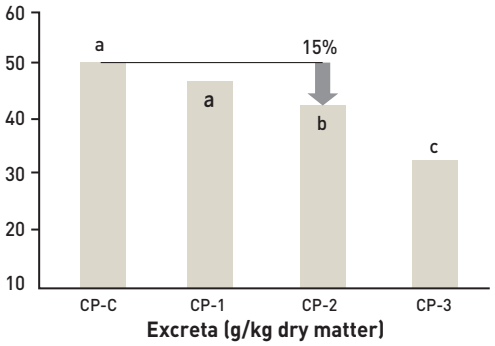
→ Broilers fed 2% CP reduced-diet showed the best growth performance

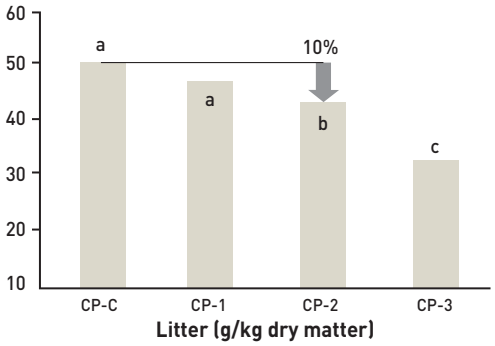




· Nitrogen Content

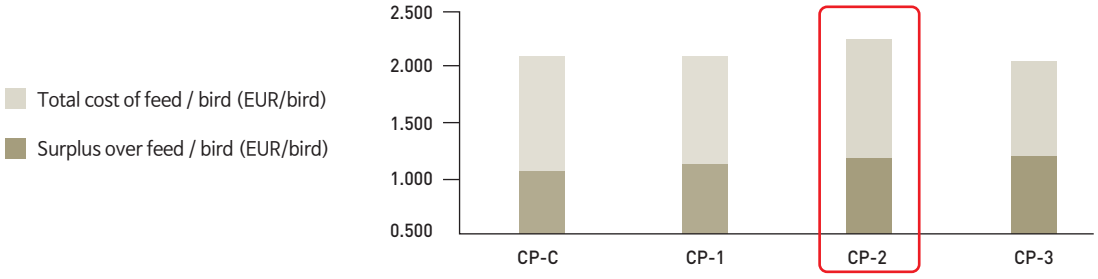
→ Nitrogen content in excreta and litter was also reduced in CP-2 group





· Economic Evaluation

→ CP-2 group showed the best economic value



	CP-C	CP-1	CP-2	CP-3
Total cost of feed / bird (EUR/bird)	1.053	1.094	1.172	1.174
Revenue / bird (EUR/bird)	2.082	2.132	2.213	2.024
Surplus over feed/bird (EUR/bird)	1.03	1.038	1.041	0.85

Conclusion

- **Reduction in the protein content by 2%** in the complete feed for broilers balanced for essential amino acid and a fixed arginine-lysine ratio **significantly improved performance.**
- **Nitrogen concentrations in excreta and manure** were significantly **lower for protein-reduced diets.**
- **The economic success,** on the one hand, is to be evaluated against the background of the costs for the individual amino acids. On the other hand, **the effects on lower N-disposal management costs for utilization of manure have to be considered.**