Nitrogen and mineral contents in broilers

P. Schlegel[1] und H. Menzi[2]

[1]Agroscope Liebefeld-Posieux, 1725 Posieux, Switzerland; [2]Swiss College of Agriculture, 3052 Zollikofen, Switzerland

Introduction

To assess nutrient cycles of broiler farms, the nutrient export is calculated by multiplying the liveweight with the nutrient content of the animal. The actually defined nitrogen (N), phosphorus (P) and potassium (K) broiler contents are respectively 26.0, 5.2 und 2.4 g / kg bodyweight (BW). These values originate from an experiment conducted in Switzerland in 1974. Since, the broiler production has dramatically changed (genetics, feeding, performance, ...). Updated values for nutrient contents in broilers are therefore required to assess more precisely the mandatory nutrient cycles in swiss broiler farms.

Material and method

Animals:	27 ready-to-slaughter broilers with Ø BW of the herd
Selection criteria:	Production program (coquelet, short, normal, extensive), Production organization (n=4), Farm (n=14; 2 broilers per farm)
Genetic:	Ross PM3 or Ross 308, Extensive: Hubbard and JA
Preparation:	Coarsely grinding, freezing, lyophilization, finely grinding
Chemical analysis:	Dry matter (DM), Kjeldahl N, Ca, P, Mg, K, Na, Cu, Fe, Mn, Zn (ICP-EOS after ash)
Data analysis:	Regression analysis (Systat 12)

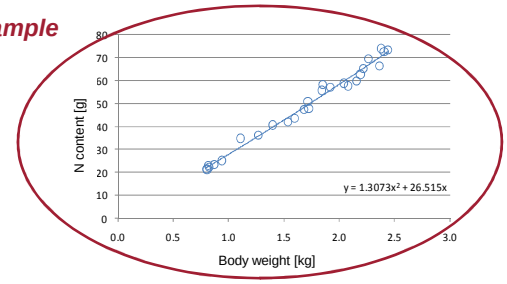
Results and discussion

Body weight was between 0.80 and 2.44 kg.

Coquelets (n=6):	0.84±0.05
Short (n=7):	1.47±0.22
Normal (n=8):	2.09±0.20
Extensive (n=6):	2.19±0.27

The BW distribution was not normal (Anderson-Darling: P=0.045; Shapiro-Wilk: P=0.02).

Example



Regressions of nutrient contents per kg BW *(intercept = 0)*

	DM [g]	N [g]	Ca [g]	P [g]	Mg [g]	K [g]	Na [g]	Cu [mg]	Fe [mg]	Mn [mg]	Zn [mg]
Dry matter (DM) basis											
Linear coefficient		81.3	19.8	16.3	0.97	8.19	3.82	4.87	232	9.37	59.5
Quadratic coefficient [1]		-	-	-	-	-1.22	-1.11	-	-	-	-
R^2		0.997	0.988	0.989	0.996	0.996	0.995	0.936	0.716	0.841	0.990
SEM		0.9	0.4	0.3	0.01	0.32	0.14	0.26	29	0.80	1.2
Fresh matter (FM) basis											
Linear coefficient	313	26.5	7.10	5.83	0.35	2.62	1.20	1.74	84	3.36	21.3
Quadratic coefficient [2]	22	1.3	-	-	-	-	-0.06	-	-	-	-
R^2	0.998	0.998	0.987	0.990	0.997	0.998	0.997	0.929	0.727	0.844	0.990
SEM	31	2.1	0.16	0.11	0.00	0.02	0.12	0.10	10	0.28	0.4

[1] Significant (P<0.05) effect of BW on K and Na contents

[2] Significant (P<0.05) Effect of BW on DM, N and Na contents

2 kg broiler: 26.5 g + 1.3 g * 2 kg BW = 29.1 g/kg BW

Conclusions

- With increasing BW: K and Na contents decreased on DM basis; N content increased and Na content decreased on FM basis.
- With increasing BW, the DM content of birds increased.
- A broiler (2 kg BW) contained 29.1, 5.8 and 2.6 g / kg BW of respectively N, P and K. These values are 12%, 12% und 8% higher than the so far used values.

Agroscope

Berner Fachhochschule
Schweizerische Hochschule für Landwirtschaft SHL

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs FDEA
Agroscope Liebefeld-Posieux Research Station ALP