

# Nitrogen and mineral contents in broilers

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## 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 and 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

*The BW distribution was not normal*

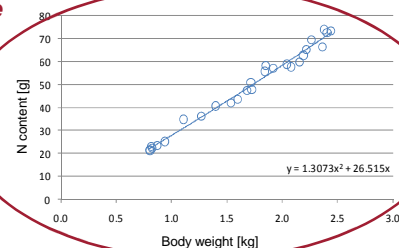
Normal (n=8): 2.09±0.20

*(Anderson-Darling: P=0.045;*

Extensive (n=6): 2.19±0.27

*Shapiro-Wilk: P=0.02).*

### Example



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

	DM	N	Ca	P	Mg	K	Na	Cu	Fe	Mn	Zn
	[g]	[g]	[g]	[g]	[g]	[g]	[g]	[mg]	[mg]	[mg]	[mg]
<b>Dry matter (DM) basis</b>											
Linear coefficient		81.3	19.8	16.3	0.97	8.19	3.82	4.87	232	9.37	59.5
Quadratic coefficient <sup>1</sup>		-	-	-	-	-1.22	-1.11	-	-	-	-
R <sup>2</sup>		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
<b>Fresh matter (FM) basis</b>											
Linear coefficient	313	26.5	7.10	5.83	0.35	2.62	1.20	1.74	84	3.36	21.3
Quadratic coefficient <sup>2</sup>	22	1.3	-	-	-	-	-0.06	-	-	-	-
R <sup>2</sup>	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

<sup>1</sup> Significant (P<0.05) effect of BW on K and Na contents

<sup>2</sup> 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.



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