ANALYSIS OF SOME MINERAL SALTS BY NEUTRON ACTIVATION METHOD

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INTRODUCTION

The industrial system in animal and poultry bringing-up has determined many changes in the technology of exploitation especially in the nutrition and the technology of feeding problems.

In the mineral nutrition domain many studies of the specialists have been issued in order to provide the animal feeding with some mineral compounds and various essential trace minerals together with their toxicity limits. Obviously in these conditions the composition of these minerals must be very well known. On this purpose the neutron activation analysis has been used.

EXPERIMENTAL

Three calcium carbonate samples from different mining sites all over the country have been analysed. The samples were homogenised and dried. Two irradiations have been carried out:

- One of 4 hours for the samples ($\sim$100 mg in weight) and Soil-5, SL-1 standards in a 2×10^{12} n/cm^2.s. flux. The measurements of 30 min.-2 hours after 7-20 days cooling time have been carried out.

A gamma spectrum of the sample 2 is shown in fig.1.

- The second one was a short irradiation of 30 s. in a 2×10^{12} n/cm^2.s flux in the air rabbit.

Sample weights of $\sim$ 40 mg have been used. W-1 reference material has been irradiated as a standard. From this last irradiation Al, Dy, Mg, Mn, Ti and V contents were determined. In table 1 the concentrations of 34 elements are given. For Au, Mo and Te determinations the monostandard method was used.

RESULTS AND DISCUSSION

The calcium carbonate salts analysed were used in 1 % proportion in the combined forages of three groups of poultry in both growing and fating periods. In another group calcium of high level of purification has been used. This group was considered as a control one. The liveweight to delivery to feed mass conversion ratio and mortality were the parameters in attention.

In these experiments the results obtained did not reveal significant differences between the four groups regarding the aforementioned parameters. Conclusions that the mineral compounds used did not influence the growing and feed conversion have been drawn.

Some trace elements determined (As, Br, Cr, Sb, Sr, Th, U, etc.) are considered toxic but their presence at the ppm level did not influence the liveweight at slaughter time or the mortality.

TABLE 1

Element	Concentration (ppm)		
	1	2	3
Al(%)	0.67 ± 0.04	0.70 ± 0.04	0.14 ± 0.02
As	3.2 ± 0.4	1.9 ± 0.2	0.4 ± 0.1
Au(ppb)	32 ± 5	8 ± 2	5 ± 1
Ba	60 ± 22	58 ± 23	190 ± 47
Br	1.5 ± 0.6	1.0 ± 0.4	0.5 ± 0.2
Ca(%)	30.6 ± 4.8	33.2 ± 5.2	30.6 ± 4.8
Ce	10.4 ± 0.6	14.7 ± 0.9	3.0 ± 0.3
Co	1.9 ± 0.1	2.4 ± 0.1	0.30 ± 0.03
Cr	20 ± 2	8 ± 1	2.3 ± 0.4
Cs	< 0.2	0.7 ± 0.1	1.8 ± 0.1
Dy	2.3 ± 0.4	2.1 ± 0.4	-

Element	1	2	3
Eu	0.28 ± 0.05	0.47 ± 0.07	0.04 ± 0.01
Fe(%)	0.36 ± 0.01	0.42 ± 0.02	0.062 ± 0.005
Hf	0.30 ± 0.08	0.7 ± 0.1	0.17 ± 0.05
K(%)	< 0.08	0.24 ± 0.08	0.04 ± 0.03
La	5.9 ± 0.4	10.0 ± 0.6	1.14 ± 0.09
Lu(ppb)	40 ± 7	75 ± 11	27 ± 5
Mg(%)	1.54 ± 0.16	0.30 ± 0.10	0.72 ± 0.08
Mn	214 ± 13	292 ± 16	307 ± 18
Mo	9 ± 1	4 ± 1	4 ± 1
Na(%)	0.26 ± 0.02	0.062 ± 0.005	0.036 ± 0.003
Rb	< 5	18 ± 6	6.4 ± 3.5
Sb	0.62 ± 0.09	0.21 ± 0.04	0.09 ± 0.02
Sc	0.65 ± 0.05	0.74 ± 0.05	0.17 ± 0.01
Sm	1.22 ± 0.07	1.7 ± 0.1	0.31 ± 0.02
Sr	281 ± 32	354 ± 36	179 ± 19
Tb	0.13 ± 0.07	0.3 ± 0.1	-
Te	6 ± 2	-	4 ± 1
Th	1.2 ± 0.1	1.3 ± 0.1	0.19 ± 0.04
Ti	385 ± 123	511 ± 107	475 ± 175
U	2.2 ± 0.3	0.9 ± 0.1	1.1 ± 0.1
V	26 ± 3	16 ± 2	4 ± 2
Yb	0.5 ± 0.1	0.6 ± 0.1	0.15 ± 0.04
Zn	20 ± 3	21 ± 3	5 ± 1

Fig. 1