Nutritional value of organic raw material for poultry

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OBJECTIVES

Organic data tables giving composition and nutritional values are requested by organic poultry producers to improve organic poultry nutrition. The objectives were : 1) to get nutritional values for main organic raw material used in poultry feed ; 2) to estimate the variability of the main protein sources and ; 3) to investigate on new protein sources for organic poultry nutrition.

MATERIAL AND METHODS

Three experiments were conducted, according to the referenced method developed by Bourdillon & *al* (1990), and adapted to slow growth strain. Tested raw materials were included to a basal diet between 10 and 30%. Apparent metabolizable energy (AME) of diets was calculated as the difference between GE intake and energy losses in excreta. AME values were then corrected for nitrogen retention (AMEn) using a factor of 34.4kJ/g. Protein utilization was calculated as the ratio between protein intake and protein excreted (with total nitrogen excreted corrected by nitrogen of ureic acid in excreta). Values of the raw materials were then calculated by difference between basal and experimental diets according to the dry matter content (Lessire & *al*, 1985).

Results : analytical and nutritional values of raw materials

	Raw material		kg of DM		Broiler		Rooster	
		MS[1] (%)	CP[2] (%)	Fat[3] (%)	AMEn[4](Kcal /kg MS)	CUDa N[5] (%)	AMEn (Kcal /kg MS)	CUDa N (%)
COMMON RAW MATERIAL	Soya meal (n=3)	90,89	45,28	6,97	2965,67	83,73	3189	85,25
	Soya bean extruded	90,63	41,45	12,24	3856	86,47	3873	83,54
	Sunflower meal (n=4)	91,935	24,355	16,4725	2373,5	79,27	2578	76,735
	Pea	87,37	22,87	0,89	3272	86,99	3306	79,5
	Faba bean	87,74	31,04	1,05	3247	83,34	3172	78,95
INNOVATIVE RAW MATERIAL	Alafalfa protein concentrate	93,4	52,31	ND	3267	71,56	3530	72,9
	Rice protien concetrate	94,81	49,01	3,83	3765	71,6	3790	71,58
	Hempseed meal	90,35	31,68	14,13	3135	81,88	2692	73,3
	Hempseed decorticated	92,52	32,33	49,92	6453	86,74		
	Sesame meal	91,63	44,72	17	2818	86,63	3644	90,84
	Cameline meal	90,5	34,55	15,95	ND	46,49	2766	71,65
	White lupine	88,93	35,64	10,85	3246	94,83	3088	77,81
ANIMAL PRODUCTS	*Hermetia illucens meal (n=2)*	84,395	42,495	28,625	4636	68,7	5421	77,855
	Slipper limpets	91,35	51,85	2,85	3837	100	2097	88,33
	Dried whey	96,3	9,57	1,77	3902	100	2834	29,58
FORAGE	Nettle dreid (n=2)	90,36	24,445	2,79	791	61,035	1368	59,415
	Fescue hay	94,13	25,06	2,51	1364	82,1		
	Ryegrass hay	93,82	27,53	3,14	1282	79,9		
	Alfalfa dried	87,47	24,95	ND	1834	73,91	2086	74

Organic Soya bean meal gave good results but with variability in fat content and protein utilization (79,92 - 85,90)
For other meals, Sunflower (ex for broiler : 76,47 - 81,55), Hempseed, Camelina, protein content and digestibility were lower than Soya meal. Digestibility may be negatively affected by their ANF content.
For all tested products, processing (extrusion, dehulling) improved digestibility of protein and energy.
Seeds and beans presented good protein utilization. However their protein content is lower than Soya meal and their amino acid profile is not optimal for poultry.
Forages, if they are of good quality, may represent a contribution to protein supply of broilers
Sea products, like slipper,limpets *(Crepidula fornicate),* presented high protein content and nutritional value. However to be used in poultry feed, the product must be dried and there is a risk for fish taste in poultry meat.
Larva of insect may represent an opportunity, but their digestibility is low and not constant (for broiler : 62,68 - 74,70).

There is a need for complementary studies about: i) amino acid profile of these raw materials; ii) the combination of these raw material in the broiler diets and during the life of animals; with the objective to improve sustainability of organic production.

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