

FEATHER MEAL AS A PROMISING COMPONENT OF COMPLETE FEEDS FOR FUR-BEARING ANIMALS

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Feather meal contains 81-84% protein in the form of creatine. The predicted production of feather meal in Russia is approx. 48 thousand tonnes a year [5]. As a component of complete feeds for agricultural animals and birds feather meal could be considered an economically-viable source of essential amino acids (EAA).

Keratin is characterised by very high levels of cystine, which plays a vital role in the metabolism of methionine (EAA) – an acid containing sulphur, essential for the formation of hair coating (the main productivity indicator in cage-reared fur-bearing animal farming). According to S. Zinoviev cystine from feather meal is related to cysteine, the level of which is 7 and 6,9 times higher than in fish and bone meal, respectively [1], so the meal has a specific action. Perhaps this is why its use is limited to 3% for chickens [1, 6] and 15% for mink [2, 4].

During the calculation of composition of complete feed for specific animals and their level of productivity, the levels of EAA and their ratio has to be considered. One method for the calculation of the biological value of proteins by their EAA content is the index of essential amino acids in relation to ideal protein (standard) according to Ozer. In animal breeding, Skrede A. suggested the following standard – cod fillet

protein, the amino acids from which are 100% digested by mink [3]. The table depicts an example of such a calculation of the main sources of protein in complete feeds for mink (CF), Furminky-1 is used as an example – a CF for mink, produced in Finland. Feather meal could be used as a balancing factor for the first critical of CF – methionine and cystine.

References

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The content of EAA in % from protein, the ratio of EAA (ratio, %) and index of EAAs (index) (%)

Of main protein-rich components of complete feeds for fur-bearing animals

Essential amino acids	FEEDS												
	Cod fillet	Fish meal		Blood meal		Bone and meat meal		HTSL feather meal		Sunflower meal		CF Furminky-1	
		%	ratio	%	Ratio	%	Ratio	%	Ratio	%	Ratio	%	Ratio
Arginine (arg)	6,3	6,3	100	4,5	71	6,0	95	7,0	111	8,1	129	6,3	100
Alanine	5,6	8,7	155	9,4	167	4,6	82	7,6	136	5,2	93	5,4	96
Histidine (his)	2,8	2,5	89	6,0	214	1,8	64	1,0	36	1,7	61	2,3	82
Isoleucine (iso)	4,4	6,0	136	1,1	25	2,8	64	5,0	114	5,2	118	4,2	95
Leucine (leu)	8,1	8,1	100	13,8	170	6,2	77	7,8	96	3,7	46	7,1	88
Lysin (lys)	9,4	8,6	91	9,3	99	5,4	57	2,1	22	3,7	57	7,6	81
Methionine+Cystine(m+c)	4,4	4,1	93	2,0	46	2,6	59	5,9	134	4,4	100	2,9	66
Threonine (thr)	5,6	4,5	80	4,5	80	3,6	64	4,7	84	4,0	71	4,1	73
Tryptophane (try)	1,3	1,2	92	1,3	100	0,7	54	0,6	46	1,3	100	1,2	92
Phenylalanine+tyrosine (p+t)	8,8	7,4	84	10,3	117	5,4	61	8,2	93	7,9	90	9,5	108
Ratio of critical EAAs, %*	none	thr-80 p+t-84 his-89	iso-25 m+c-46 arg-71	try-54 lys-57 m+c-59	lys-22 his-36 try-46	lys-39 leu-46 his-61	m+c-66 thr-73 lys-81						
Index of EAAs, %	100	99,5	95,5	66,7	75,8	79,4	87,2						
Index of limiting EAAs, % **	100	92	76,9	56,6	51,4	73,1	78,9						

*the first three critical EAAs are selected, **index of limiting EAAs (lysine, methionine+cystine, tryptophane)