

Enzyme microorganisms origin used in animal diets

No	Enzyme	Source
1	Alpha amylase	<i>Aspergillus oryzae</i> <i>Apergillus niger</i> <i>Bacillus licheniformis</i> <i>Bacillus amyloliquefaciens</i> <i>Bacillus subtilis</i> <i>Bacillus lentus</i> <i>Bacillus stearothermophilus</i> <i>Microbacterium imoeriale</i> <i>rhizopus niveus</i> <i>Rhizopus oryzae</i> <i>Trichoderma reesei</i>
2	Acid prolyl endopeptidase	<i>Aspergillus niger</i>
3	Asparaginase	<i>Aspergillus oryzae</i> <i>Aspergillus niger</i> <i>Bacillus subtilis</i>
4	aminopeptidase	<i>Aspergillus oryzae</i>
5	AMP deminase	<i>Aspergillus melleus</i>
6	Acylglycerol lipase	<i>Penicillium camemberti</i>
7	Alpha -L-arabinofuranosidase	<i>Apergillus niger</i>
8	Alpha glucosidase	<i>Aspergillus niger</i>
9	Arabanase	<i>Aspergillus niger</i>
10	Aqualysin 1	<i>Bacillus subtilis</i>
11	Alpha galactosidase	<i>Aspergillus oryzae</i>
	Beta galactosidase (lactase)	<i>Aspergillus niger</i> <i>Kluyvermyces lactis</i> <i>Bacillus circulans</i> <i>Bacillus licheniformis</i> <i>Bacillus subtilis</i> <i>Saccharomyces spp</i>
12	Beta glucanase	<i>Aspergillus niger</i> <i>Aspergillus aculeatus</i> <i>Bacillus lentus</i> <i>Paenibacillus lentus</i> <i>Penicillum funiculosum</i> <i>Trichoderma longibrachium</i>
13	Beta glucosidase	<i>Penicillium multicolor</i> <i>Aspergillus niger</i>
14	Beta amylase	<i>Bacillus licheniformis</i>
15	Beta mannanase	<i>Aspergillus niger</i>

		<i>Bacillus lentus</i> <i>Paenibacillus lentus</i> <i>Trichoderma longibrachium</i> <i>Trichoderma reesei</i>
16	Catalase	<i>Aspergillus niger</i>
17	Cellulase	<i>Talaromyces emersonii</i> <i>Penicillium funiculosum</i> <i>Trichoderma reesei</i> <i>Trichoderma viride</i> <i>Trichoderma longibrachium</i>
18	Chymotrypsin	<i>Bacillus licheniformis</i>
19	Cyclomaltodextrin glucanotransferase	<i>Geobacillus stearothermophilus</i>
20	Chymosin	<i>Kluyveromyces lactis</i>
21	Endo-1,3(4)- β -glucanase	<i>Aspergillus aculeatus</i> <i>Disporotrichum dimorphosporum</i> <i>Talaromyces emersonii</i> <i>Trichoderma reesei</i>
22	Glucanase	<i>Streptomyces violaceoruber</i>
23	Glucoamylase	<i>Aspergillus niger</i> <i>Aspergillus oryzae</i> <i>Rhizopus niveus</i> <i>Rhizopus oryzae</i>
24	Glucose oxidase	<i>Aspergillus oryzae</i> <i>Aspergillus niger</i>
25	Glucan 1,3- β -glucosidase	<i>Disporotrichum dimorphosporum</i>
26	Glutaminase	<i>Bacillus amyloliquefaciens</i>
27	Hemicellulase	<i>Aspergillus aculeatus</i> <i>Aspergillus niger</i> <i>Bacillus lentus</i> <i>Bacillus subtilis</i> <i>Trichoderma reesei</i>
28	Invertase	<i>Aspergillus niger</i> <i>Saccharomyces sp.</i>
29	Lactase	<i>Aspergillus niger</i> <i>Aspergillus oryzae</i> <i>Candida pseudotropicalis</i> <i>Saccharomyces sp</i>
30	Leucyl aminopeptidase	<i>Rhizopus oryzae</i>
31	Lipase	<i>Aspergillus niger</i> <i>Aspergillus oryzae</i> <i>Candida rugosa</i> <i>Rhizopus oryzae</i>
32	Lysophospholipase	<i>Aspergillus niger</i>
33	Maltogenic amylase	<i>Bacillus subtilis</i>

34	Mucorpepsin	<i>Rhizomucor miehei</i>
35	Pectin lysae	<i>Trichoderma reesei</i> <i>Aspergillus niger</i>
36	Pectinase	<i>Aspergillus niger</i> <i>Aspergillus aculeatus</i> <i>Rhizopus oryzae</i>
37	Pectinestraxe	<i>Trichoderma reesei</i> <i>Aspergillus niger</i>
38	Polygalacturonase	<i>Aspergillus aculeatus</i> <i>Aspergillus niger</i> <i>Trichoderma reesei</i>
39	Phospholipase A1	<i>Aspergillus oryzae</i>
40	Phospholipase A2	<i>Trichoderma reesei</i>
41	Phytase	<i>Trichoderma reesei</i> <i>Aspergillus niger</i> <i>Aspergillus oryzae</i>
42	Polygalacturonase	<i>Aspergillus niger</i>
43	Protease	<i>Aspergillus niger</i> <i>Aspergillus oryzae</i> <i>Bacillus subtilis</i> <i>Bacillus licheniformis</i>
44	Pullulanase	<i>Bacillus subtilis</i> <i>Bacillus licheniformis</i> <i>Bacillus acidopullulyticus</i> <i>Klebsiella pneumonia</i>
45	Phytase	<i>Aspergillus niger</i> <i>Aspergillus oryzae</i> <i>Trichoderma reesei</i> <i>Penicillium funiculosum</i> <i>Schizosaccharomyces pombe</i> <i>Pichia pastoris</i>
46	subtilisin	<i>Bacillus licheniformis</i>
47	Trypsin	<i>Fusarium venenatum</i>
48	Triacylglycerol lipase	<i>Aspergillus oryzae</i> <i>Aspergillus niger</i> <i>Candida cylindracea</i> <i>Candida rugosa</i> <i>Penicillium roqueforti</i> <i>Rhizopus oryzae</i> <i>Rhizopus niveus</i>
49	Urase	<i>Lactobacillus fermentum</i>
50	Xylanase	<i>Aspergillus oryzae</i>

	<i>Aspergillus acidus</i> <i>Aspergillus niger</i> <i>Bacillus licheniformis</i> <i>Bacillus lentus</i> <i>Bacillus pumilus</i> <i>Bacillus subtilis</i> <i>Disporotrichum dimorphosporum</i> <i>penicillum funiculosum</i> <i>Trichoderma citrinoviridae</i> <i>Trichoderma reesei</i> <i>Talaromyces emersonii</i>
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Reference:

- 1 Food enzyme application submitted to the Commission within the legal European Commission safety of the food chain version 4, updated on 25 July 2016
- 2 Association of American Feed Control Officials 2016 official Publication
- 3 Food and Drug Administration , Center for Veterinary Medicine
- 4 LIST OF CODEX SPECIFICATIONS FOR FOOD ADDITIVES