



## VII. DAFTAR PUSTAKA

- Akiba, Y., K. Sato, K. Takahashi, M. Toyomizu, K. Matsushita and H. Komiyama. 2001. Meat color of broiler chicken as affected by age and feeding of yeast *phaffia rhodozyma* containing high concentration of asthaxantin. *Anim. Sci. J.* 72: 147 – 153.
- AOAC. 1994. Official Methods of Analysis. 14<sup>th</sup> Ed. Association of official analytical chemist. Arlington VA.
- Arellano, L., F.P.G Carillo, E. Avilla and F. Ramos, 1997. Shrimp head meal utilization in broiler feeding. *Poult. Sci.* 76 (Supp.1):85 (Abstr.)
- Arzita. 1994. Produksi enzim protease dari *Aspergillus oryzae* dan *Bacillus subtilis* menggunakan medium limbah tahu dengan berbagai dosis inokulum. Thesis. MIPA Kimia, Institut Teknologi Bandung.
- Austin, P.R. 1988. Chitin solutions and purification of chitin. In: Methods of enzymologi Vol. 161.
- Bastaman, S. 1989. Studies on degradation and extraction of chitin and chitosan from prawn shell (*Nephrops norvegicus*). The Queen's University of Belfast.
- Bronner, F., 1987. Intestinal calcium absorption mechanism and application. *J. Nutr.*, 117: 1347-1352
- Borin, K., J.E. Limberg. and R.B. Ogle, 2005. Digestibility and digestive organ development in indogenous and improved chicken and ducks diets with increasing inclusion level of cassava leaf meal. *J. Anim. Physio and Anim Nutr.* 12: 38 -42.
- Castro, G., N. Stoyan and J.P. Nyers. 1989. Assimilation efficiency in birds, a function of taxon and food type?. *Comp. Biochem.Physiol.*, 92: 271-278.
- Cavazzoni, V., A. Adami and C. Castrovilli. 1998. Performance of broiler chickens supplemented with bacillus coagulans as probiotic. *British Poult. Sci.* 39: 526-529.
- Chawan, C.B. and R.W. Gerry, 1974. Shrimp waste as a pigmen source in broiler diets. *Poult. Sci.* 53: 671-676.
- Chen, H.C. and K.S. Chen. 1991. Isolation bacteria and their hydrolitic activity on shrimp shell. in: part b: life science. Proceeding of the national science council, roc, National Taiwan Ocean University Keelung, Taiwan. Departemen Biologi, Institut Teknologi Bandung. Bandung.



- Compere, P., M.F.J. Versali and G. Goffinet. 2002. Glycoprotein from the cuticle of the atlantic shore crab *carcinus maenas*: i. Electrophoresis and western-blot analysis by use of lectins. *Biol. Bull.* 202: 61-73.
- Direktorat Jenderal Budidaya Departemen Perikanan dan Kelautan. 2005. dalam Prasetyo, K.W. Pengolahan limbah cangkang udang. *Kompas*, 15 Mei 2006.
- Djunaidi, I.H., Sjoftjan, O., M.H. Natsir dan Kompiang, I.P. 2002. Substitusi pakan komersial dengan pakan non konvensional terfermentasi pada unggas. *Laporan Penelitian*. Universitas Brawijaya. Malang.
- Djunaidi, I.H. 2008. Perubahan nilai nutrisi limbah udang hasil fermentasi dengan *Aspergillus oryzae*. *Laporan Penelitian*. Universitas Brawijaya. Malang.
- Endo, T. and M. Nakano. 1999. Influence of a probiotic on productivity, meat components, lipid metabolism, caecal flora and metabolites, and raising environment in broiler production. *J. Anim. Sci.* 70 (4): 207-218.
- Ensminger, M.E., J.E Oldfield, and W.W. Heinemann. 1990. *Feed and Nutrition*. 2nd ed. The Ensminger publishing company. California.
- Fanimu, A.O., E.Mudama, T.O.Umukoro, and O.O. Oduguwa. 2004. Substitution of shrimp waste for fish meal in broiler chicken ratio. *Trop.agric.* 73: 201-205.
- Fox, C.J., P. Blaw, J.H. Brown and I. Watson, 1994. The effects of various processing methods on the physical and biochemical properties of shrimp head meals and their utilization by juvenile *Penaeus monodon* fab. *Aquaculture*, 122: 209-226.
- Gandjar, I. 1977. The fermentation of mucuna pruriens seeds. First asean workshop of grain legumes. Cikopo, Bogor.
- Gernat, A.G. 2001. The Effect of using different levels of shrimp meal in laying hen diets. *Poult. Sci.* 80: 633-636.
- Gohl, B. 1998. *Tropical feeds*. FAO software developed by speedy. A & Waltham N. version 8.
- Han, B.K., J.K. Moon, Y.W. Ryu, Y.H. Park and D.H. Jo. 2000. Purification and characterization of acidic chitinase from gizzard of broiler (*Gallus gallus L.*). *J. Biochem and Molec. Biol.* 33(4): 326-331.



UNIVERSITAS  
GADJAH MADA

**Evaluasi penggunaan hasil fermentasi limbah udang dalam pakan terhadap performan dan kualitas daging broiler**

DJUNAIDI, Irfan Hadji, Promotor Prof. Dr. Ir. Tri Yuwanta, SU., DEA

Universitas Gadjah Mada, 2010 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Hartadi, H., S. Reksohadiprodjo, dan A.D. Tillman. 1990. Tabel komposisi makanan untuk Indonesia. Gajah mada university press. Yogyakarta.

Hartati, F.K., T. Susanto, S. Rakhmadiono, dan L. Adi. 2002. Faktor-faktor yang berpengaruh terhadap deproteinasi menggunakan enzim protease dalam pembuatan kitin dari cangkang rajungan (*Portunus pelagicus*). Biosain. Vo. 2 No. 1. 69-79.

Hessing, M., H. van Laahoven, J.A. Rooke, and A. Morgan. 1996. Quality of soybean meal (sbm) and effect of microbial enzymes in degrading soya anti nutritional compounds (anc). 2<sup>nd</sup> inter. soybean processing and utilization conference. p. 8-13. Bangkok, Thailand.

Hetland, H., B. Svihus and M. Choct. 2005. Role of insoluble fibre on gizzard activity in layers. J. Appl. Poult. Reseach. 14 : 38–46.

Hirano, S., C. Itakura, H. Siro, Y. Akiyama, I. Nonaka, N. Kanabara and T. Kawakami, 1990. Chitosan as an ingredient for domestic feeds. J. agric. Food Chem. 38: 1214-1217.

Homma, H. and T. Shinohara. 2004. Effects of probiotic *Bacillus toyoi* on abdominal fat accumulation in the japaness quail (*Coturnix japonica*). 75: 37-41.

Hong, K.N., S.P.Mayer, and K.S. Lee, 1989. Isolation and characterization of chitin from crawfish shell waste. J. Agri. And Food Chem., 37.

Huang, R.L., Y.L. Lin, G.Y. Yu, Y.G. Zhang, T.J. Li, L.L. Li, M.X. Li, Z.R. Tang, J. Zhang, B. wang,, J.H. He and X.Z. Nie. 2005. Effect of dietary oligochitosan supplementation on ileal digestibility of nutrients and performance in broilers. Poult. Sci. 84:1383-1388.

Ingweye, J.N., B.I. Okon, J.A. Ubuia and A.I. Essien. 2008. Performance of broiler chicken fed fish and shrimp waste. Asian J. of Anim. Sci. 2 (2): 58-63.

Islam, M.A., M.D. Hossian, S.M. Baibul and M.A. Howlider, 1994. Unconventional feed for broilers. Indian vet. J. 74: 775-780.

Jeuniaux, C. and C. Cornelius, 1978. Distribution and activity of chitinolytic enzymes in the digestion tract of birds and mammals. P 542-549 in : Proceeding of the 1<sup>st</sup> Inter. conference on chitin/chitosan. R.A.A. Muzarelli and E.R. Periser, ed. MIT press, Cambridge.



- Jin, L.Z., Y.W. Ho, N. Abdullah and S. Jalaludin. 1998. Growth performance, intestinal microbial population, and serum cholesterol of broiler fed diets containing lactobacillus culture. *Poult. Sci.* 77: 1259-1265.
- Jorgensen, H., X.Q. Zhao, K.E.B. Knudsen and B.O. Eggum. 1996. The influence of dietary fibre source and level on the development of the gastrointestinal tract, digestibility and energy metabolism in broiler chickens. *British J. Nutr.* 75: 379-395.
- Kheiri, F. and H.R. Rahmani, 2006. The effect of reducing calcium and phosphorous on broiler performance. *Int. J. Poult. Sci.*, 5: 22-25.
- Khempaka, S., K. Koh and Y. Karasawa. 2006<sup>a</sup>. Effect of shrimp meal on growth performance and digestibility in growing broilers. *J. Poult. Sci.*, 43: 250-254.
- Khempaka, S., M. Mochizuki, K. Koh and Y. Karasawa. 2006<sup>b</sup>. Effect of chitin in shrimp meal on growth performance and digestibility in growing broilers. *J. Poult. Sci.*, 43: 339-343.
- Kim, S.H., S.Y. Park, D.J. Yu, S.J. Lee, K.S. Ryu and D.G. Lee. 2003. Effects of feeding aspergillus ferments on performance, intestinal microflora, blood serum components and environmental factors in broiler. *Kor. J. Poult. Sci.* 30:151-159.
- Kidd, M.T., G.W. Morgan and C.J. Price. 2001. Enzyme supplementation to corn and soybean meal diets for broilers. *J. applied Poult. Res.*, 10:65-70.
- Kobayashi, S. and H. Itoh, 1991. Effects of dietary chitin and chitosan on growth and abdominal fat deposition in chick. *J. Poult. Sci.* 26: 114-120.
- Kobayashi, S., Y. Terashima and H. Itoh. 2002. The effects of dietary chitosan on liver lipid concentration in broiler chickens treated with propylthiouracil. *J. Poult. Sci.* 43: 162-166.
- Krogdahl, A. and J. L. Sell. 1989. Influence of Age on lipase, amylase and protease activities in pancreatic tissue and intestinal content of young turkey. *J. Poult. Sci.* 68: 1561-1568
- Lee, M.G., K. Michiharu and Y. Kyoden. 1990. Hypocholesterolemic effect of phototropic bacterial cells in rats. *J. Nutr. Sci. Vitaminol.* 36: 475-483.
- Li, X.J., X.S. Piao, S.W. Kim, P.Liu, L. Wang, Y.B. Shen, S.C. Jung and H.S. Lee. 2007. Effect of chito-oligosaccharide supplementation on performance, nutrient digestibility, and serum composition in broiler chickens. *Poult. Sci.* 86: 1107-1114.



- Mahagna, M., I. Nir, M. Larbier and Z. Nitsan. 1995. Effect of age and exogenous amylase and protease on development on development of digestive tract pancreatic enzyme activities and digestibility of nutrients in young meat-type chicks. *reprod. nutrition development*. 35: 201-212.
- Mahata, M.E., A.A. Dharma dan Y. Rizal. 2006. Potensi kitinase bakteri *Serratia marcescense* untukmeningkatkan kualitas dan penggunaannya sebagai pakan unggas. Laporan penelitian. Unv. Andalas Padang.
- Mahata, M.E. 2007. Repairing shrimp waste nutrientquality as poultry feed through chitinases and chitinase hydrolysis from *Serratia marcescense* bacterium. Disertasi. Univ. Andalas Padang.
- Minoru, M., S. Hiroyuki and S. Yoshihiro,2002. Control of function chitine and chitosan by chemical modification. Minireview, in trends in Glycoscience and Glycotechnology. 14 No 78. p. 205-222.
- Mirzah. 1997. The influence of shrimp waste meal processing with steam pressure at quality and its utilization in broiler ration. Disertation. Padjadjaran University. Bandung.
- Mohan, S.K.M. and E. Siravaman. 1993. The feeding value of dried prawn waste in the ration of swine. *J. Vet. Anim. Sci.* 24: 103–108.
- Muchtadi, D., N.S. Palupi dan M. Astawan. 1992. Enzim dalam industri pangan. PAU Pangan dan Gizi, Institut Pertanian Bogor.
- Ngoan, L.D., B. Ogle and J.E. Limberg. 2000. Ensiling tehniques for shrimp by-product and their nutritive value. *Asian-Aust. J. Anim. sci.* 13: 1278 – 1284.
- Ngoan, L.D. and J.E. Limberg. 2001. Ileal and total tract digestibility in growing pigs fed cassava root meal and rice bran diets with inclusion of fish meal and fresh or ensiled shrimp by-product. *Asian-Aust. J. Anim. sci.* 14: 216–223.
- Ngoan, L.D., B. Ogle and J.E. Limberg. 2001. Effect of replacing fish meal with ensiled shrimp by-product on the performance and carcass chracteristic of growing pigs. *Asian-Aust. J. Anim. sci.* 14: 82–87.
- Nguyen, T.K.D. 2005. Evaluation of agro-industrial by-product as protein sources for duck production in the mekong delta of Vietnam. Doctoral thesis. Swedish University of Agricultural science. Uppsala.
- No, H.K., S.P. Meyer and K.S. Lee. 1989. Isolation and characterization of chitin from crawfish shell waste. *J. agric. Food Chem.* 37(3) : 575-579.



- North, M.O. 1984. Commercial chicken production manual. Avi. Publishing Co. Inc. West port, Connecticut.
- NRC. 1994. Nutrient requirements of poultry. Ninth Revised Edition. National Academy Press. Washington, D.C.
- Nurrohani. 2000. Deproteinasi kulit udang windu (*Panaeus monodon Fabr*) menggunakan isolat bakteri *Bacillus* sp. Jurusan Kimia FMIPA IPB Bogor.
- Nwanna, L.C. 2003. Nutrition value and digestibility of fermented shrimp head waste meal by african catfish *clarias gariepinus*. Pak. J. Nutr., 2: 239-245.
- O'Brien, J., S.S. Kumari, and D.F. Skinner. 1993. Diffrential localization of specific protein in the exoskeleton of the bermuda land crab. in: the crustacean integument. morphology and biochemistry. M.N. Horst and J.A. Freeman eds. CRC Press, Boca Raton
- Oduguwa, O.O., A.O. Fanimu, V.O. Olayemi and N.Oteri. 2004. The feeding value of sun-dried shrimp waste based diets for *starter* and *finisher* broilers. Arch. Zootec. 53: 87-90.
- Okoye, F.C., G.S. Ojelowa and K. Njoku-Onu, 2005. Evaluation of shrimp waste meal as probable animal protein source for broiler chicken. Int. J. Poult. Sci., 458-461.
- Onifade, A.A. and G. M. Babatunde. 1998. Comparison of the utilization of palm kernel meal, brewers dried grain and maize offals by broiler chicks. British Poult. Sci. 39: 245-250.
- Ponte, P.I.P., I. Mendes, M. Quaresma, M.N.M. Aguiar, J.P.Lemos, L.M.A. Ferreira, M.A. Soares, C.M. Alfaia, J.A.M. Prates and C.M.G.A. Fontes. 2004. Cholesterol level and sensory characteristic of meat from broilers consuming moderate to high levels of alfalfa. Poult. Sci. 83: 810-814.
- Rachman, A. 1989. Pengantar teknologi fermentasi. PAU Pangan dan Gizi. IPB. Bogor
- Ravindran, V., L.I. Hew, G. Ravindran and W.L. Bryden. 1999. A comparison of ileal digesta and excreta analysis for determination of amino acid digestibility in food ingredients for poultry. British Poult. Sci. 266-274.
- Razdan, A. and D. Petterson 1994. Effect of chitin and chitosan on nutrient digestibility and plasma lipid concentration in broiler chickens. British J. Nutr. 72: 277-288.



UNIVERSITAS  
GADJAH MADA

Evaluasi penggunaan hasil fermentasi limbah udang dalam pakan terhadap performan dan kualitas daging broiler

DJUNAIDI, Irfan Hadji, Promotor Prof. Dr. Ir. Tri Yuwanta, SU., DEA

Universitas Gadjah Mada, 2010 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Razdan, A. and D. Petterson 1996. Hipolipidaemic, gastrointestinal and related response of broiler chickens. *British J. Nutr.* 76: 287-397.

Razdan, A. J. Petterson and D. Petterson 1997. Broiler chickens. Body weight, feed intake, plasma lipid and small intestinal acid concentration in response to feeding chitosan and pectin. *British J. Nutr.* 78: 283-291.

Rodriguez, A.T., C. Sartor, S.E. Higgins, A.D. Wolfenden, L.R. Bielke, C.M. Pixley, L. Sutton, G. Tellez and B.M. Hargis, 2005. Effect of *Aspergillus* meal prebiotic (Fermacto) on performance of broiler chicken in the starter phase and fed low protein diets. *J. Appl. Poult. Res.* 14: 665-669.

Romziah, S. H. Setiono, M. Hayati, Y.M. Indrawani, dan K. Rochiman. 1981. Pengaruh berbagai tingkat penggunaan tepung limbah udang di dalam ransum ayam broiler terhadap pertumbuhan dan konsumsi ransum. Direktorat P3M. FKH. Universitas Airlangga, Surabaya.

Rose, S.P. 1997. Principles of poultry science. CAB International. Biddles Ltd. Guildford, United Kingdom.

Rosenfeld, D.J., A.G. Gernat, J.D. Marcano and J.A. Flores. 1997. The effect of using different levels of shrimp meal in broiler diets. *Poult. Sci.* 76: 581-587.

Rutherford, S.M., T.K. Chung, and P.J. Moughan. 2007. The effect of a commercial enzyme preparation on apparent metabolizable energy, the true ileal amino acid digestibility, and endogenous ileal lysin losses in broiler chickens. *Poult. Sci.* 86: 665-672.

Sakomura, N.K., I. Zanella, M. Pack, M.S. Salanova, A.P. Rosa and L. Magon. 1998. Effects of soybean processing and enzyme addition on nutrient digestibility in corn-soybean broiler diets. *Proceed. Southern Poult. Sci. Symposium.* Atlanta.

Saleh, F., A. Ohtsuka, T. Tanaka and K. Hayashi. 2003. Effect of enzymes of microbial origin on in vitro digestibilities of dry matter and crude protein in soybean meal. *J. Anim Sci.* 74: 23-29.

Salma, U., A.G. Miah, T. Maki, M. Nishimura and H. Tsujii. 2007. Effect of dietary *rhodobacter capsulatus* on cholesterol concentration and fatty acid composition in broiler meat. *Poult. Sci.* 86: 1920-1926.

Santoso, U., K. Tanaka and S. Ohtani. 1995. Effect of dried *Bacillus subtilis* culture on growth, body composition and hepatic lipogenic enzyme activity in female broiler chicks. *British J. Nutrition* 74: 523-529.



UNIVERSITAS  
GADJAH MADA

**Evaluasi penggunaan hasil fermentasi limbah udang dalam pakan terhadap performan dan kualitas daging broiler**

DJUNAIDI, Irfan Hadji, Promotor Prof. Dr. Ir. Tri Yuwanta, SU., DEA

Universitas Gadjah Mada, 2010 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Sarmiento, F. M., J. M. McNab, A. Pearson and R.C. Belmar. 2003. The effect of *chaya* (*cnidoscolus aconitifolius*) leaf meal and exogenous enzymes on amino acid digestibility in broiler. *British Poult. Sci.* 44: 458 – 463.

SAS Institute Inc. 1996. *SAS user's guide: Statistics*. SAS Institute, Cary, NC.

Scott, M.L., Nesheim, M.C. and R.J. Young. 1992. *Nutrition of the Chicken*. 5<sup>th</sup> M.L. Scott and Associates. Ithaca, New York.

Shurtleff, W and A. Aoyagi. 1979. *The book of tofu*. Autum Press, Massachusetts.

Soeparno, 1998. *Ilmu dan teknologi daging*. 3<sup>rd</sup> ed. Gadjah Mada University Press. Yogyakarta.

Steel R.G. D. and J.H. Torrie. 1992. *Principles and Procedures Statistics*. @nd Ed. McGraw-Hill Book Co., Inc., Singapore.

Stephen, A.M. 1995. *Food Polysacharide and Their Application*. Marcel Dekker Inc. New York

Sudarmadji, S., B. Haryono, dan Suhardi, 1997. *Prosedur analisa untuk bahan makanan dan pertanian*. Liberty, Yogyakarta

Suliantari dan W.P. Rahayu. 1990. *Teknologi fermentasi biji-bijian dan umbi-umbian*. Depdikbud dan Pusat antar universitas pangan dan gizi. IPB. Bogor.

Svihus, B. And H. Hetland. 2001. Ileal starch digestibility in growing broiler chicken fed on a wheat based diet is improved by mash feeding, dilution with cellulose or whole wheat inclusion. *British Poult. Sci.* 42: 633 – 637.

Toan, N.H. and L.D. Ngoan. 2003. Evaluation of shrimp by-product for laying hens in smallholder systems in thua hue province. in : *proc. final national seminar workshop on sustainable livestock production on local feed resources*. (Ed. Preston R and B. Ogle) HUAF-SAREC. 25 – 28 March 2003.

Vincent, J.F.V., 2006. *Arthropod cuticle - a natural composite shell system*. <http://www.bath.ac.uk/mech-eng/biomimetics/cuticle.pdf>. download tanggal 15 Juni 2007. 04.15.

Wahyu, J. 1992. *Nutrisi unggas*. Gadjah Mada University Press. Yogyakarta.

Wanasuria, S. 1990. *Tepung kepala udang dalam pakan broiler*. Poultry Indonesia. Jakarta.



UNIVERSITAS  
GADJAH MADA

**Evaluasi penggunaan hasil fermentasi limbah udang dalam pakan terhadap performan dan kualitas daging broiler**

DJUNAIDI, Irfan Hadji, Promotor Prof. Dr. Ir. Tri Yuwanta, SU., DEA

Universitas Gadjah Mada, 2010 | Diunduh dari <http://etd.repository.ugm.ac.id/>

- Wang, X.W., Y.G. Du, X.F. bai and S.G. Li. 2003. The effect of oligochitosan on broiler gut flora, microvilli density, immune function and growth performance. *Acta Zoonutr. Sin.* 15:32-45.
- Werner, C., S. Janisah, U. Kumbot and M. Wioko. 2009. Comparative study of the quality broiler and turkey meat. *Br. Poult. Sci.*, 50: 318-324.
- Winarno, F.G. 1980. Pengantar teknologi pangan. PT. Gramedia. Jakarta.
- Www. [pubs.caes.uga.edu/caespubs/pubcd/B1187.htm](http://pubs.caes.uga.edu/caespubs/pubcd/B1187.htm). download tanggal 10 desember 2009. 05.20.
- Yamamoto, M., F. Saleh, M. Tahir, A. Ohtuska and K. Hayashi. 2007. The effect of Koji-feed (fermented distillery by-product) on the growth performance and nutrient metabolizability in broiler. *J. Poult. Sci.* 44: 291-296.
- Yarmo, M.A., C.R.C. Mat, M.R. Zainuddin, Y.K. Samah and A. Alimuniar. 1995. Study on the effect of protein chitin as a chicken feed additive. In: *Chitin and Chitosan : the versatile environmentally friendly modern material*. Universiti Kebangsaan Malaysia.
- Zakana, H.A.H., M.A.R. Jalal, and M.A.A. Ishmais. 2010. The influence of supplemental multi-enzyme feed additive on the performance, carcass characteristics and meat quality traits of broiler chickens. *Inter. J. Joul. Sci.* 9 (2): 126-133
- Zanella, I., N.K. Sakomura, F.G. Silversides and A. Figueirido. 1999. Effect of enzyme supplementation of broiler diets based on corn and soybeans. *Poult. Sci.* 78:561-568.
- Zuprizal, M. Larbier and A.M. Chagneau. 1992. Effect of age and sex on true digestibility of amino acids of rapeseed and soybean Meals in growing broilers. *Poult. Sci.* 71 : 1486 – 1492.