

DAFTAR PUSTAKA

- Aberle, E. D., J. C. Forrest, D. E. Gerrard, E. W. Mills, H. B. Hedrick, M. D. Judge dan R. A. Markel. 2001. Pronciples of Meat Science. 4thEdition. Kendall/Hutt Publishing Co, Iowa.
- Abubakr M.A. S and W. M. A. Adiwish. 2017. Isolation and identification of lactic acid bacteria from different fruits with proteolytic activity. International Journal of Microbiology and Biotechnology. 2(2): 58-64.
- Adinarayana K, P. Ellaiah , and D. S. Prasad . 2003. Purification and partial characterization of thermostable serine alkaline protease from a newly isolated *Bacillus subtilis* PE-11 AAPS. J Pharm Sci Tech. 4(4) : 56-59.
- Adriana, L. B., Perez, S. Mungula, and A. Farres. 2008 . Novel extracellular proteolytic in pediococcus acidilactici ATCC 8042. Can J Microbiol 54(8): 694-699.
- Afrila A. dan F. Jaya. 2012.Keempukan, pH dan aktivitas air (aw) dendeng sapi pada berbagai konsentrasi ekstrak jahe (*zingiber officinale* roscoe) dan lama perendaman yang berbeda. Jurnal Ilmu dan Teknologi Hasil Ternak. 7(2):6-12
- Akunkugbe F. C. and A. A. Onilude .2013. Isolation, identification and screening of xylanase and glucanase-producing microfungi from degrading wood in Nigeria. African Journal of Agricultural Research. 8(34), 4414-4421
- Alvarado, C., G.B.E. Almendarez, S.E. Martin and C. Regalado.2006. Food-associated lactic acid bacteria with antimicrobial potential from traditional mexican foods. Mic. Alam 48(3-4) : 260-268.
- Ammor, S., C. Rachmanb, S. Chaillouc, H. Prevostb, X. Doussetb, M. Zagorecc, E. Dufoura, and I. Chevalliera. 2006. Phenotypic and genotypic identification of lactic acid bacteria isolated from a small-scale facility producing traditional dry sausages. J Food Microbiol 22: 373–382.
- AOAC (Association Official Analytical Chemistry). 2005. Official Method of Analysis. 18th Edition. Maryland (USA): AOAC International.
- APHA (American Public Health Association). 1992. Standar Methods for The Examination of Dairy Products. 16th Ed. Port City Press.,Washington D.C.
- Apriyantono, A., D. Fardiaz, N. L. Puspitasari, Sedarwati dan S. Budiyanto. 1989. Petunjuk Laboratorium Analisis Pangan. Institut Pertanian Bogor, Bogor.

- Arief, I.I., R.R.A. Maheswari dan T. Suryati. 2003. Proses pengempukan daging Sapi *dark firm dry* (DFD) melalui teknologi fermentasi oleh bakteri asam laktat *Lactobacillus plantarum*. Laporan Penelitian Dasar. Institut Pertanian Bogor,Bogo
- Arief, I. I., R.R.A. Maheswari, T. Suryati, Komariah dan S. Rahayu. 2008. Kualitas mikrobiologi sosis fermentasi daging sapi dan domba yang menggunakan kultur kering *Lactobacillus plantarum* 1B1 dengan umur yang berbeda. Media Peternakan 31(1): 36-43 .
- Arief I.I, B. S. L. Jenie , M. Astawan, A. Witarto, and K. Fujiyama K. 2010. Identification Indonesian lactic acid bacteria using sequencing 16S rRNA gene. [research report]. Osaka (JP): Osaka University.
- Arkoudelos, J. S., G. J. E. Nychas and F. Samaras. 1998. The occurrence of *Staphylococci* on Greek fermented sausages. Fleischwirtschaft International. J. for Meat Production and Meat Processing. 12 (3): 178-192
- Badewi B. 2002. Studi teknologi dan mutu serta keamanan pangan daging sapi asap (sei). [Tesis]. Bogor: Pascasarjana Institut Pertanian Bogor.
- Baradarana., H. Foo, C. C. Sieo and R. A. Rahim. 2012. Isolation, identification and characterization of lactic acid bacteria from *Polygonum minus*. Romania Biotechnological Letter. 17 (30):7245-7252.
- Baehaki A, Rinto dan A. Budiman. 2011. Isolasi dan karakterisasi protease dari bakteri tanah rawa Indralaya. J. Teknol. dan Industri Pangan,21(1): 37-42.
- Bergmeyer, H.V. and Grassl, (1983), Method of Enzymatic Analisis 2. Verlag Chemia, Weinhein.
- Bredholt, S., T. Nesbakken, and A. Holck. 1999. Protective cultures inhibit growth of *Listeria monocytogenes* and *E. coli* 0157:H7 in cooked, sliced, vacuum- and gas-packaged meat. Int. J. Food Microbiol. 53:43- 52
- Brooks G.F, J. F. Buteel and A. S. Morsedan . 2001. Mikrobiologi Kedokteran Edisi Pertama (Terj). Bagian Mikrobiologi Fakultas Kedokteran Universitas Airlangga (Eds). Salemba Media, Jakarta.
- Budiarto, B.R., A. Z. Mustopa, A.Z. and T. Idarmawan, T . 2016.Characterization of partially extracellular proteases from bekasam-isolated *Lactobacillus plantarum* S31 and its application to hydrolyze skimmed-milk with antibacterial property.. International Food Research Journal 23(1): 340-349.

Buckle, K. A., R. A. Edwards., G. H. Fleet dan M. Wooton. 1987. Ilmu Pangan. Terjemahan : Purnomo dan Adiono. Universitas Indonesia Press, Jakarta.

Busairi, AM. 2010. Effect of nitrogen sources and initial sugar concentration on lactic acid fermentation of pineapple waste using *Lactobacillus delbrueckii*. J Teknik. 1(31) : 10-17.

Calkins, C. R., and G. Sullivan. 2010. Adding Enzymes to Improve Beef Tenderness. University of Nebraska. Casida, L.E. 1968. Industrial Microbiology. John Wiley and Sons Inc. New York.

Cary, J. W., Linz, J. E. and bhatanagar, D. 2000. Microbial Foodborne Disease: Mechanism of pathogenesis and Toxin Synthesis.Cancaster: Techonomic Publishing Company, Inc

Chen1, Y. S., H.c. Wu and F. Yanagida. 2010. Isolation and characteristics of lactic acid bacteria isolated from ripe mulberries in taiwan. Brazilian Journal of Microbiology 41: 916-921

Cleveland, J., J.T. Montville, I.F. Nes and M.L.Chikindas. 2001. Bacteriocin: Safe, natural antimicrobials for food preservation. International J.Food Microbiol. 71: 1-20.

Cowan, M.K. and K.P. Talaro. 2009. *Microbiology : A Systems Approach*. 2nd. Ed. McGraw-Hill Companies, Inc. New York.

Creighton E. T., 1993. *Protein Struktur and Molecular Properties*. 2nd Ed. New York : W. H. Freeman and Company.

DaescheL, M. A. and T. R. Klaenhammer . 1985. Association of a 13.6- megadalton plasmid in *Pediococcus pentosaceus* with bacteriocin activity. Applied and Environmental Microbiology 50, 1538-1 541

Damayanti, D., E. Setiawati., U. Masudi dan M. Fitriadi. 2001. Pembuatan daging fermentasi sebagai makanan sehat dan aman dikonsumsi. Laporan Lomba Karya Inovatif Produktif. Fakultas Peternakan. Institut Pertanian Bogor, Bogor.

Del-portillo, P., Murillo, L.A., and Patarrogo, M.E., 1991. Amplification of a species-specific DNA fragment of *M.tuberculosis* and its possible use in diagnosis. *J. Clin. Microbiol.* 29, 2613–2668

Desniar, I. Rusmana, A. Suwanto, dan N. R. Mubarik. 2012. Senyawa antimikroba yang dihasilkan bakteri asam laktat asal bekasam. Jurnal Akuatika. 3 (2) : 135-145.

Dewan Standarisasi Nasional. 1992. Standar Nasional Indonesia 01-3947. Daging Sapi. Standarisasi Nasional Jakarta Indonesia, Jakarta.

Donkor. O. N., A. Henriksson, T. Vasiljevic and N. P. Shah. 2007. Proteolytic activity of dairy lactic acid bacteria and probiotics as determinant of growth and in vitro angiotensin-converting enzyme inhibitory activity in fermented milk. ©INRA,EDP Sciences,Lait 86. 21–38.

Dransfield, E dan D.E. Etherington. 1981. Enzyme in the Tenderization of Meat. In: Brick, G.G., N.Blakebrough dan K.J. (eds). Enzymes and Food Producing. Applied Sci. Publ. Ltd., London

Drider, D., G. Fimland G, Y. Hechard , L. McMullen , and H. Prevost H. 2006. The continuing story of class IIa bacteriocins. Microbiol. Molecular Biol. Rev. 70:564-582.

Eksin, N.A.M. 1990. Biochemistry of Food. Second Ed. Academic Press. Inc. New York.

Ernest, J. 1996. Mikrobiologi Kedokteran. Edisi 20. EGC, Jakarta.

Fardiaz, S. 1992. Mikrobiologi Pangan 1: Gramedia Pustaka Utama. Jakarta.

Fardiaz S. 1989. Petunjuk Laboratorium. Analisis Mikrobiologi Pangan:Pusat Antar Universitas Pangan dan Gizi, Direktorat Jenderal Pendidikan Tinggi, Departemen Pendidikan dan Kebudayaan, Institut Pertanian Bogor.Bogor

Food and Environmental Hygiene Department. 2014. Microbiological Guidelines for Food: For Ready-to-Eat Food in General and Specific Food Items. Hongkong (HK): Food and Environmental Hygiene Department.

Frazier , W.C. and Westhof, D.C. 1988. Food Microbiology. Singapore: McGraw

Galvez, A., H. Abriouel, R. L. Lopez, and N. B. Omar. 2007. Bacteriocin-base strategies for food biopreservation. Int J Food Microbio. 120:51-70.

Gaman, P.M., and K.B. Sherrington. 1992. Pengantar Ilmu Pangan Nutrisi dan Mikrobiologi. Gadjah Mada University Press, Yogyakarta.

Gaonkar, A.G. 1995. Ingredient Interaction On Food Quality. Marcel Dekker inc. New York.

Garabal J. I., P. R. Alonso . and. J. A. Centeno. 2007. Characterization of lactic acid bacteria isolated from raw cow's milk cheeses currently produced in Galicia (NW Spain). Swiss (US): Swiss Soc. of Food Sci. And Technol.

- Girindra, A. 1990. Biokimia 1.: PT Gramedia Pusaka Utama. Jakarta.
- Gobbetti M, L. Stepaniak , M. De Angelis, A. Corsetti , and R. Di Cagno. 2002 . Latent bioactive peptides in milk proteins: proteolytic activation and significance in dairy processing. Crit Rev Food Sci Nutr. 42: 223 – 239.
- Granum, P.E. and T. C. Baird-Parker. 2000. *Bacillus* species. Dalam : Lund,B.M., Baird-Parker, T.C. and Gould, G.W (ed). The Microbiological Safety and Quality of Food, Volume II, hal 1029-1039. AspenPublishers, Inc. Gaithersburg, Maryland
- Hagstrom A, J. Pinhassi and U. L. Zweifel. 2000. Biogeographical diversity among marine bacterioplankton. Aquat Microbial Ecol 21 : 231-244
- Helferich, W. and D. Westhoff. 1980. All About Yoghurt. Prentise Hall . Inc., Inglewood Cliffs .New York.
- Hofvendahl, K. 1998. Fermentation of Wheat Starch Hydrolysate by *Lactococcus lactis*: Factors Affecting Product Formation.(http://www.lub.lu.se/cgi-bin/show_diss.pl/db=global&fname-tec 220.html)
- Holt, J.G., N.R Krieg, P.H.A. Sneath, J.T. Staley and S.T.Williams. 1994. Bergey's Manual of Determinative Bacteriology. 9th ed. Williams and Wilkins, Maryland
- Hutkins, R. W. 2006. Microbiology and Technology of Fermented Foods. IFJ Press. Blacwell Publishing Ltd. Iowa. PP 3-49.
- Illanes A. 2008. Enzim Biocatalysis, de Valpara iso : Springer Science, Business Media B. V. <http://dx.doi.org/10.1007/9781-4020-8361-7>
- Imanningsih N. 2012. Profil Gelatinisasi Beberapa Formula Tepung-Tepungan Untuk Pendugaan Sifat Pemasakan. Penel Gizi Makan. 35(1): 13-22.
- International Commission on Microbiological Specifications for Foods. 1996. *Staphylococcus aureus*. In: Microorganisms in foods: Microbiological specifications of food pathogens. Roberts TA, Baird-Parker AC, Tompkin RB, editor. London (UK): Blackie Academic.
- Istrati D , C. Vizireanu and R. Dinica. 2011. Influence of vacuum packaging on quality of beef muscle after different tenderization method. Journal of Agroalimentary Process and Technologies. 7(3):275-280.
- Jack R.W., R. T. A. John and Bibekray. 1995. Bacteriocins of Gram-Positive Bacteria, Microbiological review, (59): 2.

- Jahidin J. P. 2014. Aspek Mikrobiologi dendeng asap dengan daging yang berbeda pada pengasapan tempurung kelapa. Jurnal Ilmiah Ilmu-Ilmu Peternakan. 27 (1): 39-43
- Katikou P., I. Ambrosiadis, D. Georgantelis, P. Koidis and S.A. Georgakis . 2005. Effect of Lactobacillus-protective cultures with bacteriocin-like inhibitory substances producing ability on microbiological, chemical and sensory changes during storage of refrigerated vacuum-packaged sliced beef. Journal of Applied Microbiology . 99: 1303–1313
- Ketnawa S. and S, Rawahuea. 2011. Application of bromelin extract for muscle food tenderization. zfood and nutrition sciences, 2(5):393-401.
- Khasrad . 2010. Keempukan daya mengikat air dan *cooking loss* daging sapi pesisir hasil penggemukan. Seminar Nasional Teknologi Peternakan dan Veteriner . 257-262.
- Khunajakr, A., W. Aporn ., M. Duangtip and T. Sukon . 2008. Screening and identification of lactic acid bacteria producing antimicrobial compounds from pig gastrointestinal tracts, KMITL Sci. Tech. J. Vol. 8 No. 1, 8-11
- Klaenhammer, T. R., M. A. Azcarate-Peril, E. Altermann and R. Barrangou. 2011. Influence of the dairy environment of gene expression and substrate utilization in lactic acid bacteria. Journal of Nutrition. 137:748-750.
- Komariah, I. I. Arief dan Y. Wiguna . 2004.Kualitas Fisik dan Mikroba Daging Sapi yang Ditambah Jahe (*Zingiber officinale Roscoe*) pada Konsentrasi dan Lama Penyimpanan yang Berbeda. Media Peternakan.,27 (2): 46-54
- Kopermsub P. and S. Yunchalard. 2010. Identification of lactic acid bacteria associated with the production of *pla-a-som*, a traditional fermented fish product from Thailand. International Journal of Food Microbiology. 138: 200-204
- Kopermsub P, S. Vichitphan and S. Yunchalard . 2006. Lactic acid bacteria isolated from *Plaa- som*, a Thai fermented fish product. Thai J Biotechnol 7: 32-39.
- Kosim A., T. Suryati dan A. Gunawan. (2015). Sifat fisik dan aktivitas Antioksi dan dendeng daging sapi dengan penambahan stroberi (*fragaria ananassa*) sebagai bahan. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan. (3) 3: 189-199

Kurniati N. 2015. Produksi Enzim Protease Dari Bakteri Asam Laktat Asal Bekasam. Thesis. Sekolah Pascasarjana Institut Pertanian Bogor. Bogor

Lade, H. S.; M. P. Chitanand, G. Gyananath, and T. A. Kadam. (2006), Studies on some properties of bacteriocins produced by *lactobacillus* species isolated from agro-based waste. The Internet J. Microbiol., 2(1). 123-139.

Lawrie, R.A. 2003. Meat Sciences. 5th edition. Terjemahan : A. Parakasi dan Yudha A. Universitas Indonesia Press, Jakarta.

Lay, B. W dan S. Hastowo. 1992. Mikrobiologi. Rajawali Press, Jakarta

Legowo, A.M, Nurwantoro dan Sutaryo. 2005. Analisis Pangan. Badan Penerbit Universitas Diponegoro. Semarang.

Lehninger, A.L. 2005. Dasar-dasar Biokimia. Thenawidjaja M, penerjemah Erlangga. Terjemahan dari : Principles of Biochemistry. Jakarta.

Le Loir, Y., F. Baron, and M. Gautier. 2003. *Staphylococcus aureus* and food Poisoning. J. of Genetic and molecular Research; 2 (1): 63-67.

Leroy, F. and L. D. Vuyst. 1999. Temperature and pH conditions that prevail during fermentation of sausages are optimal for production of the antilisterial bacteriocin Sakacin K. Applied and Environmental Microbiology 65: 974–981

Leslie S.B, E. Israeli , B. Lighthart , J. H. Crowe and L. M. Crowe. 1995.Trehalose and Sucrose Protect Both Membranes andProteins in Intact Bacteria during Drying. J. Appl. Environ.Microbiol. 61: 3592-3597.

Lorenz K. J and K. Kulp (eds.) Handbook of Cereal Science and Technology. Marcell Dekker inc., New York.

Lucke, F.K. 2000. Utilization of Microbes to Process and Preserve Meat. Meat Science 56 : 105-115.

Mabrouk, A. M., B. A. Effat, Zainab I. Sadek, Gehan A. M. Hussein and M.N.I. Magdoub (2007). Probioticproperties of some *lactobacillus* strains. International Journal of Probiotics and Prebiotics 2 (4): 175 - 184.

Madigan, M.T., and J. M. Martinko. 2006, Brock Biology of Microorganisms, United States of America : Pearson Education International

Maiti, A.K., S.S. Ahlawat, D.P. Sharma and N. Khana .2008. Application of natural tenderizer in meat- a review. Department of animal product technology india. Agric. Rev. 29(3): 226-230.

Mangunwidjaja.D, dan A. Suryani.1994.Teknologi Bioproses.Penebar Swadaya.Jakarta

Marchesi J.R . 1998. Design and evaluation of useful bacterium-specific PCR primers that amplify genes coding for Bacterial 16S rRNA. Appl Environ Microbiol 64: 795-799.

Melliawati, R., A. C. Djohan., dan Yopi. 2015. Seleksi bakteri asam laktat sebagai penghasil enzim protease. Prosiding Seminar Nasional Masyarakat Biodiv Indonesia. 1 (2): 184-188.

Mozzi, F., R. R. Raya , and G. M. Vignolo . 2010. Biotechnology of Lactic Acid Bacteria: Novel Applications. London (UK): Blackwell Publishing, Ltd. Hlm: 3-5.

Muchtadi, T. R., S. Fardiaz dan N. S. Indrasti. 1992. Analisis Mikroteknik dalam Ilmu Pangan. Departemen Pendidikan dan Kebudayaan Direktorat Jenderal Pendidikan Tinggi Pusat Antar Universitas Pangan dan Gizi Institut Pertanian Bogor, Bogor.

Muchtadi, T dan Sugiyono. 1989. Ilmu Pengetahuan Bahan Pangan. IPB-Press. Bogor.

Muliati, K., N. Harijani, V. Thomas., dan Widijatno. 2014. Potensi enzim protease dari *Pediococcus pentosaceus* sebagai pengempuk dan gambaran histologis daging. Jurnal Veterinaria Medika. 7 (3) : 240:247.

Murtini, J. 1992. Bekasam ikan mas. Penelitian Pascapanen Perikanan. Pusat Penelitian dan Pengembangan Perikanan. Jakarta.

Murtini, E.S dan Qomarudin. 2003.Pengempukan daging dengan enzim protease tanaman biduri (Calotropis gigantea). Jurnal Teknologi dan Industri Pangan. 14 (3); 266-268.

Naiola E. dan N. Widhyastuti. 2007. Semi Purifikasi dan Karakterisasi Enzim Protease *Bacillus* sp. Berkala Penelitian Hayati 13, 51-56.

Nakazawa, Y. and A. Hasano. 1992. Function of fermented milk. London and New York: Elsevier Applied Science.

Netcher, E.W. 2001. Microbiologi a Human Perspective. 3rd edition. Mc. Graw Hill. New York.

Novianti D. 2013. Kuantitas dan identifikasi bakteri asam laktat serta konsentrasi asam laktat dari fermentasi ikan gabus (*Channa Striata*), ikan nila (*Oreochromis Niloticus*), dan ikan sepat (*Trichogaster Trichopterus*) pada pembuatan bekasam. *Sainmatika*.10(2):34-41

Nuraida L, W. Siti, Hana, dan P. Endang . 2011. Evaluasi *in vitro* terhadap isolate bakteri asam laktat asal air susu ibu untuk mengasimilasi kolesterol dan mendekonjugasi garam empedu. *J Tekno Indust Pangan*.22:46-58.

Nurmalinda A, Periadnadi dan Nurmiati. 2013. Isolasi dan karakterisasi parsial bakteri indigenous pemfermentasi dari buah durian (*Durio zibethinus*). *Jurnal Biologi Universitas Andalas* 2(1), 8-13.

Nursyam H,. 2011. Penggunaan kultur starter bakteri asam laktat pada pengolahan sosis fermentasi ikan lele dumbo yang diinfeksi *Listeria monocytogenes* ATCC-1194. *J.Exp. Life Sci.* 1 (2): 88-94

Oke M.A., and A.A. Onilude. 2014. Partial purification and characterization of extracellular protease from *Pedicoccus acidilactici*. *Nigerian Journal of Basic and Applied Science*. 22(1-2): 19-25

Ouwehand, A. C. and S. Vesterlund. 2004. Antimicrobial components from lactic acid bacteria. In: Salminen, S., A. V. Wright and A. Ouwehand (editors). *Lactic Acid Bacteria Microbiological and Functional Aspects*. 3rd Edition, Revised and Expanded. Marcel Dekker, Inc., New York

Oyeleke S. B, E. C. Egwin, and S. H Auta. 2010. Screening of *Aspergillus flavus* and *Aspergillus fumigatus* strains for extracellular protease enzyme production. *J Microbiol Antimicrob*. 2(6): 2141-2307.

Paludan M., C.M. Madsen, P. Sophanodora, L. Gram and. P.L. Moller. 2002. Fermentation And Microflora Of Plaa-Som, A Thai Fermented Fish Product Prepared With Different Salt Concentrations. *International Journal Food Microbiology*. 73 : 61-70.

Pan, X., F. Chen, T. Wu, H. Tang and Z. Zhao. 2009. The acid, bile tolerance and antimicrobial property of *Lactobacillus acidophilus* NIT. *Food Control*. 20 : 598-602.

Pangastuti A. 2006. Definisi Spesies prokaryot berdasarkan urutan basa gen penyandi 16srRNA dan Gen Penyandi Protein. *J Biodiversitas* 7(3) : 292-296.

- Papagianni M and S. Anastasiadou. 2009. Pediocins: the bacteriocins of Pediococci. Sources, production, properties and applications [review]. *Microbial Cell Factories* 8: 1-16.
- Poliana, J. and Mac Cabe AP. 2007. Industrial Enzymes; Structure, Function, and Applications. Springer, Dordrecht.
- Pommerville, J. C. 2011. Alcamo's Fundamentals of Microbiology. Jones and Bartlett Publishers, Canada.
- Pramono H., Murwantoko dan T. Heru 2013 . Identifikasi Molekuler Bakteri Asam Laktat Penghasil Bakteriosin Pada Terasi, Peda Dan Petis Sebagai Bahan Pengawet Produk Olahan Ikan. Seminar Nasional Masyarakat Hasil Perikanan Indonesia (MPHPI) ke V. Semarang.
- Puspawati N. N., L. Nuraida, dan D. R. Adawiya. 2010. Penggunaan berbagai jenis bahan pelindung untuk mempertahankan viabilitas bakteri asam laktat yang di isolasi dari air susu ibu pada proses pengeringan beku. *Jurnal Teknologi dan Industri Pangan*, 11(1): 59-65
- Putranto W.S. 2006. Purifikasi dan Karakterisasi Protease Yang Dihasilkan *L. Acidophilus* Dalam Fermentasi Susu Sapi Perah. Seminar Nasional Bioteknologi Cupturing Opportunities Through Biotechnology. Pusat Penelitian Bioteknologi. LIPI
- Putri, W. D. R., Haryadi., D. W. Marseno dan M. N. Cahyanto. 2012. Isolation and characterization of amylolytic lactic acid bacteria during growol fermentation, an indonesian traditional food. *Teknologi Pertanian* 13(1): 52-60
- Qihe, C., H. Guoqing, J. Yingchun and N. Hui. 2006. Effects of elastase from a *Bacillus* strain on the tenderization of beef meat. *Food Chem.* 98 : 624-629.
- Rahayu, W.P., S. Ma'oen, Suliantari., dan S. Fardiaz. 1992. Teknologi Fermentasi Produk Perikanan.: Pusat Antar Universitas Pangan dan Gizi. Institut Pertanian Bogor Produk Perikanan.: Pusat Antar Universitas Pangan dan Gizi. Bogor.
- Rahayu, E.S. 2000. Bakteri asam laktat dalam fermentasi dan pengawetan makanan. Fakultas Teknologi Pertanian. Universitas Gadjah Mada. Yogyakarta
- Rahayu. 2003. Bahan Pangan Hasil Fermentasi, Pusat Antar Universitas Pangan dan Gizi, Universitas Gajah Mada, Yogyakarta.
- Rahayu P dan S. Nurosiyah. 2008. Evaluasi Sensori. Jakarta : Universitas Terbuka.

- Rajkovic, A., M. Kljajic, N.Smigic, F. Devlieghere., and M. Uyttendale. 2013. Toxin producing *Bacillus cereus* persist in ready-to-reheat spaghettibolognese mainly in vegetative state . International Journal of FoodMicrobiology 167: 236-243.
- Rao, M.B., A.M. Tanksale, S.G. Mohini and V.V. Deshpande. 2007. Molecular and Biotechnological Aspect of Microbial Proteases. *Microbiol. Mol. Biol. Rev.* 62 : 597
- Ray, B. 1996. Fundamental Food Microbiology. CRC Press Inc. Sorensen, O., J.V. Dankersgoed, M.C. McFall, K. J.Indon.Trop.Anim.Agric. 34 [1] .
- Ray B. 2010. Fundamental Food Microbilogy 3rd Edition. CRC Press, Boca Raton, London, New York, Washington DC.
- Richardson T, and D. B. Hyslop. 1985. Enzyme.Didalam: Fennema,O.R (Ed). Food Chemistry. New York: Mac Kerel Bekker.
- Rosyidah E . 2013. Isolasi Bakteri Asam Laktat dan Selulolitik Serta Aplikasinya Untuk Meningkatkan Kualitas Tepung Jagung. Thesis. Sekolah Pascasarjana Institut Pertanian Bogor. Bogor.
- Sambrook J. and D. W. Russel. 2008. Molecular Cloning a Laboratory Manual, Third Edition. Cold Spring Harbor Laboratory Press, New York.
- Savadogo, A., C.A.T. Outtara, I.H.N. Bassole and A.S.Traore. 2004. Antimicrobial activities of lactic acid bacteria *strains* isolated from Burkina Faso fermented milk. *Pakistan Journal of Nutrition.* 3:174-179.
- Seftiono, H. 2017. Penentuan aktivitas enzim mananase dari berbagai mikroorganisme di indonesia dan peranannya dalam bidang pangan : Kajian Pustaka. Agrointek Volume 11(1):14-20.
- Seminar Nasional Masyarakat pengelolah hasil perikanan Indonesia (MPHP) ke V Semarang
- Setyaningsih D., A. Apriyantono dan M. P. Sari. 2010. Analisis Sensori Untuk Industri Pangan dan Agro. Institut Pertanian Bogor Press. Bogor.
- Sharmin S, Mohammad T.H.and Anwar M.N. 2004. Proteolytic activity of a *lactobacillus* spesies isolated from rumen. *Pakistan J Bio Sci.* 7(12): 2105-2108
- Shin, H. S., J. H. Lee, J. J. Pestka and Z.Ustunol. 2000. Growth and viability of Commercial *Bifidobacterium* spp. in skim milk containing oligosaccharides and inulin. *J. Food Sci.* 65 (5): 884 – 887.

- Sihombing D. E. 2014. Aktivitas Antimikrob Plantarisin Asal *Lactobacillus Plantarum* Iia-1a5 Dan Aplikasinya Sebagai Pengawet Alami Pada Daging Sapi. Thesis. Sekolah Pascasarjana Institut Pertanian Bogor. Bogor.
- Soeka Y. S, S. H. Rahayu, N. Setianingrum dan E. Naiola. 2011. Kemampuan *Bacillus licheniformis* dalam memproduksi enzim protease yang bersifat alkalin dan termofilik. Media Litbang Kes. 21:2.
- Soeparno. 2005. Ilmu dan Teknologi Daging. Gadjah Mada University Press. Yogyakarta.
- Standbury, P.F., dan A. Withaker. 1984. Principle of Fermentation Technologi. Oxford.
- Steel, R. G. D and J. H. Torrie. 1995. Prinsip dan Prosedur Statistika. Terjemahan: B. Sumantri. PT Gramedia Pustaka Utama, Jakarta.
- Suarsana, I.N., I.H. Utama dan N.G.A.A. Suartini. 2001. Aktivitas in vitro senyawa antimikroba dari *Streptococcus lactis*. J. Veteriner. 2: 25-31.
- Sudarmadji, S., B. Haryono dan Suhardi. 1997. Prosedur Analisa untuk Bahan Makanan dan Pertanian. Penerbit Liberty. Yogyakarta.
- Suharsono dan U. Widystuti. 2008. Penuntun Praktikum; Pengantar Genetika Molekuler. Departemen Biologi-FMIPA. Institut Pertanian Bogor. Bogor.
- Suhartono M.T. 2000. Enzim dan Bioteknologi. Pusat Antar Universitas. Institut Pertanian Bogor. Bogor.
- Sulistijowati R. 2002. Potensi filtrat *Lactobacillus acidophilus* ATCC 4796 sebagai biopreservatif pada rebusan daging ikan tongkol. IJAS . 2 (2)
- Sulthoniyah S. T. M., Hardoko., and H. Nursyam. 2015. Characterization of extracellular protease lactic acid bacteria from shrimp paste. Journal of Life Science and Biomedicine. 5(1): 01-05
- Sunarlim R. dan Misgiyarta. 2008. Kombinasi *Lactobacillus Plantarum* dengan *Lactobacillusbulgaricus* dan *Streptococcus Thermophilus* terhadap mutususu fermentasi selama penyimpanan. Seminar Nasional Teknologi Peternakan Dan Veteriner. 312-316.
- Swacita, I.B.N. 2002. Pengempukan daging sapi dengan protease jahe. Jurnal veterineri. Vol. 3 : No. 2.

- Tami S. W, L. E. Radiati and E. S. Widayastuti. 2013. Pengaruh konsentrasi ekstrak nenas dan lama perendaman terhadap kadar air, lemak dan protein daging ayam kampung.
- Theron, M.M. and J.F.R. Lues. 2011. Organic Acids and Food Preservation. Florida (US): CRC Press. Hlm: 273.
- Thomas, T. D and G.G. Pritchard. 1987. Proteolytic enzymes from dairy starter cultures. *Fed. Eur. Microbiol. Soc. Microbiol. Rev.* 46:245.
- Trismilah, Wahono S., Amarila M. dan Mohamad S. 2014. Isolasi dan karakterisasi protease serupa tripsin (PST) dari *Lactobacillus plantarum* FNCC 0270. *Jurnal Ilmu Kefarmasian Indonesia*, 12(1): 57-66
- Triyantini, R. Sunarlim, J. Dharma dan T.P Indrarmono. 1986. Pengaruh macam daging dan lama pelayuan terhadap mutu bakso sapi. Prosiding Seminar Nasional LIPI 7: 359 – 364.
- Triwibowo, E.A. 2006. Aktivitas antimikroba *Lactobacillus sp.* hasil isolasi dari daging sapi terhadap bakteri patogen Gram positif dan Gram negatif. Skripsi. Fakultas Peternakan. Institut Pertanian Bogor. Bogor.
- Turk B. 2006. Targeting proteases: successes, failures and future prospects. (Review). *Nat Pub Group* : 5.
- Usmiati. S., Abubakar, Miskiyah, S. Yuliani, dan T. Ariyanti. 2008. Teknologi produksi Bakteriosin sebagai Biopreservatif untuk mengendalikan Kontaminan pada Daging segar. Laporan Penelitian. Balai Besar penelitian dan Pengembangan Pascapanen pertanian. Bogor.
- Usmiati, S., Miskiyah, dan R.R.A. Maheswari. 2009. Pengaruh penggunaan bakteriosin dari *Lactobacillus sp.* galur SCG 1223 terhadap kualitas mikrobiologi daging sapi segar. *Jurnal Ilmu Ternak dan Veteriner*. 14 (2) : 150-166.
- Usmiati S. dan N. Richana. 2011. Potensi Bakteriosin dari *Lactobacillus sp* galur SCG1223 sebagai biopreservatif pada daging segar. *Buletin Teknologi Pasca Panen Pertanian*. 7(2) 72-85.
- Utami, D. P., Pudjomartatmo dan A. M. P. Nuhriawangsa. 2011. Manfaat bromelin dari ekstrak buah nenas (*Ananas comosus* L. Merr) dan waktu pemasakan untuk meningkatkan kualitas daging itik afkir. *Sains Peternakan*. 9 (2) 82-87.
- Utarti, E., L. Nurita dan S. Arimurti. 2009. Karakterisasi protease ekstrak kasar *Bacillus sp* 31. *Jurnal Ilmu Dasar Vol. 10 No. 1. 2009* : 102 – 108

- Vamanu, A., E. Vamanu , M. Drugulescu , O. Popa and Campeanu G. 2006. Identification of lactic bacterium galur used for obtaining a pollen-based probiotic product. Turkey Journal of Biology. 30:75-80.
- Vermeulen N., M. Pavlovic, A. Matthias, Ehrmann, G. Michael, Gaenzle, R. F. Vogel. 2005. Functional Characterization of the Proteolytic System of *Lactobacillus sanfranciscensis* DSM 20451T during Growth in Sourdough. Applied And Environmental Microbiology, 71.(10): 6260–6266.
- Vichasilp, C., M. Sangjindavon, and P. Wiliapun. 2008 . Theuse of selected lactic acid bacteria isolates foracce laration of fermented fish (Pla-ra) process. Kasetart university fisheries research bulletin 32(3): 17-25.
- Ward, D.M. 1998. A natural species concepts for procaryotes. Current Opinion in Microbiol 1: 271-277.
- Widiada, I.G.N. 2006. "Isolasi dan Identifikasi Bakteri Asam Laktat Indigenous dari Susu Kuda Liar Bima Selama Penyimpanan dan Aktivitas Antibakterinya" (*Tesis*). Denpasar: Universitas Udayana.
- Widya D. R. P., T. D. Widyaningsih, dan D. W. Ningtyas. 2008. Produksi biolaktat kering kultur campuran *Lactobacillus* sp dan *Saccharomyces cereviceae* Jurnal Teknologi Pertanian. 9 (2) : 38 – 149
- Winkowski K., A. D., Crandall, and T.J. Montville. 1993.Inhibition of *Listeria monocytogenes* by *Lactobacillus bavaricus* MN in beef systems at refrigeration temperaturest. Applied and Environmental Microbiology, Aug. 1993, 59(8): 2552-2557.
- Wikandari, P.R., Suparmo, Y. Marsono, dan E. S.Rahayu. 2012. Karakterisasi bakteri asam laktat proteolitik pada bekasam. Jurnal Natur Indonesia 14(2): 120-125.
- Whitaker, J.R. and C.Y Lee. 1995. Recent advances in chemistry of enzymatic browning: anoverview. In C.Y. Lee and J.R. Whitaker, eds., Enzymatic browning and its prevention.Washington, ACS Symp.Ser.600, pp. 2-7.
- Wheeler, T. L. , S. D. Shackelford and M. Koohmaraie. 2002. Technical note :Sampling methodology for relating sarcomere length, collagen concentration, and the extent of postmortem proteolysis to beef and pork *longissimus* tenderness. Journal of Animal Science. 80 : 982-987.

- Xu Y., M. Dai, J. Zang, Q. Jiang and W. Xia. 2015. Purification and characterization of an extracellular acidic protease of *Pediococcus pentosaceus* isolated from fermented fish. Food Science and Technology Research, 21 (5); 739-744
- Yuan Q. and A. Hayash. 2009. Purification and characterization of cold-adapted metalloprotease from deep sea water lactic acid bacteria *Enterococcus Faecalis* TN-9. International Journal of Biology. 1 (2). 12-21.
- Yuliana. 2008. Kinetika pertumbuhan bakteri asam laktat isolat T5 yang berasal dari tempoyak. Jurnal teknologi industri dan hasil pertanian. 73:2.
- Yulinery T., i. Y. Petria dan N. Nurhidaya. 2009. Penggunaan antimikroba dari isolat *Lactobacillus* terseleksi sebagai bahan pengawet alami untuk menghambat pertumbuhan *Vibrio SP*. Dan *Staphylococcus Aureus* pada fillet ikan kakap. Berkala Penelitian Hayati: 15: (85–92),
- Yusmarini, R., Indrati, T. Utami dan Y. Marsono. 2009. Isolasi dan identifikasi bakteri asam laktat proteolitik dari susu kedelai yang terfermentasi spontan. Jurnal Natur Indonesia 12(1): 28-33.
- Yusra, F. Azima, Novelina dan Periadnadi. 2013. Antimicrobial activity of lactic acid isolated from Budu of west Sumatra to food biopreservatif. Pakistan Journal of Nutrition. 12(7):628-635.