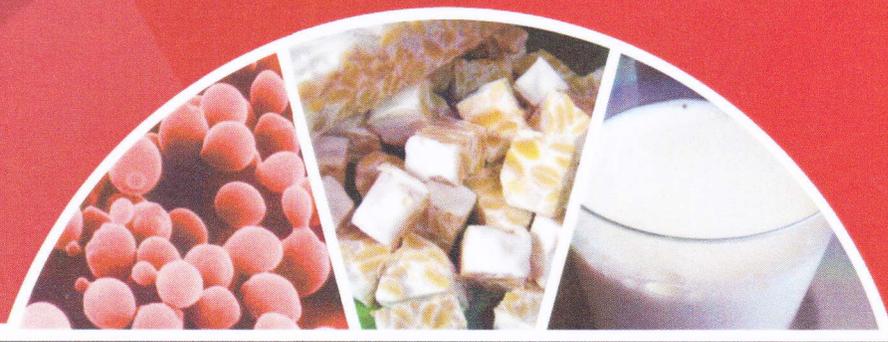
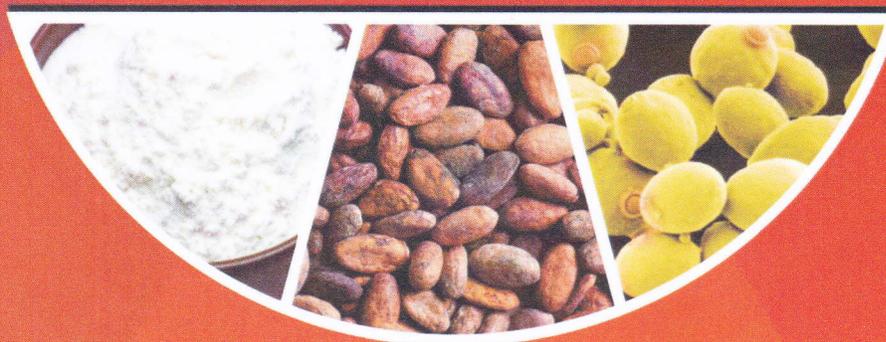


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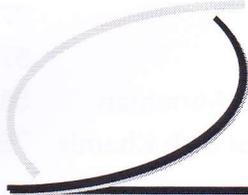
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1. Mikroorganisme - Fungsi

I. Judul

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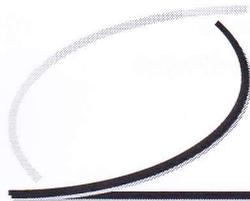


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DAFTAR PUSTAKA

- Barners, E.M., Impey, C.S., Geeson, J.D., and Buhagiar, R.W.H., 1978. The effect of storage temperature on the shelf life of eviscerated air-chilled turkeys. *Br.,Poult. Sci.*, (191):77.
- Barnett, J., R.W. Payne dan D. Yarrow. 2000. *Yeast: Characteristics and Identification*, 3rd edition, Cambridge University Press, Cambridge.
- Bennion, Marion., 1980. *The Science of Food*, Harper and Row, Publisher San Francisco, pp311-312.
- Beuchat, L.R. 1993. Selective media for detecting and enumeration foodborne yeast. *Int. J.Food Microbiol.* 19:1-4.
- Biotechnology.* 12:1-44.
- Brown, A. D., 1990. Compatible solutes and extreme water stress in eukaryotic microorganisms, *Adv. Microbiol. Physiol.*, 17:181-190.
- Buck, J.D., Bubucis, P.M/. and Combs, T.J., 1977. Occurrence of human-associated yeast in bivalve shellfish from Long Island Sound. *Appl. Environ.Microbiol.* (33):370.
- Carlin, F., Nguyen-The,C., Chambury,Y., and Reich, M. 1990. Effects of control atmospheres on microbial spoilage, electrolyte leakage and

- sugar content of fresh ready to use grated carrots. *Int. J. Food sci. technol* (25):110.
- Cole, M.B., and Keenan, M.H.J., 1986. Synergistic effects of weak-acid preservatives and pH on the growth of *Zygosaccharomyces bailii*. *Yeast* (2):93.
- Dalton, H.K., Board, R.G., and Davenport, R.R., 1984. The yeasts of British fresh sausage and minced beef. *J. Microbiol. Serol., Antonie van Leeuwenhook* (50):227.
- De Boek, E., and Kuik, D., 1987. A survey of the microbiological quality of the blue-veined cheese. *Neth. Milk Dairy technol* (41):227.
- Deak, T. 1991. Foodborne yeast. *Ads Appl Microbiol* 36:179-278
- Deak, T. 1995. Methods for the Rapid Detection and identification of yeasts in foods. *Trends in Food Science and Technology* 6:287-292.
- Fell, J.W., Boekhout, T., Fonseca, A., Scorzetti, G., Stazell-Talman, A. 2000. Biodiversity and systematics of basidiomycetous yeasts as determined by large subunit D1/D2 domain sequence analysis. *Inter. Journal of Systematic and Evolutionary Microbiology*. 50:1351-1371.
- Flanigan, B., 1987. The microflora of barley and malt in Brewing Microbiology, priest, F.G., and Campbell, I., Eds., Elsevier., London., 83.
- Fleet G.H., 1999. Microorganisms in Food Ecosystems in *Int. J. Food Microbiol.* 50, 101-107.
- Fleet, G.H. 1990. Yeasts in dairy products-a review. *J. Appl Bacteriol.* 68:199-211.
- Fleet, G.H. 1992. Spoilage yeasts. *Crit Rev Biotechnol* 12: 1-44.
- Fleet, G.H. 2006. The Yeast Handbook. Amparo Querol, Graham H. Fleet (Eds): Yeasts in Food and Beverages. Springer-Verlag Berlin Heidelberg. Chapter 1.

- Fleet, G.H., and W. Praphailong., 2005. Yeasts. In: C.J. Moir., C.A-Kabilafkas., G.Arnold., B.M.Cox., A.D. Hocking., I. Jenson., (Eds), Spoilage of Processed Foods:Causes and Diagnosis. AIFST Inc. NSW Branch Food Microbiology group. PO Box 1303, Waterloo DC NSW 2017.PP 383-399.
- Fleet, G.H., 1990. Food spoilage yeasts. In *Yeast Technology*, Spencer,J.F.T., and Spencer,D.M., Eds., Springer-Verleg., Berlin. P 124
- Fleet, G.H., 1992. Soilage yeasts. *Critical Reviews in Biotechnol.*(12(1/2):1-44.
- Fleet, G.H., and Mian, M.A., 1987. The occurrence and growth of yeasts in dairy products, *Int.J. Food Microbiol.* (4):145.
- Fuller, R. 1992. *Probiotics the Scientific Basis*. Chapman & Hall. The University Press Cambride.
- Golden *et al.* 1987. Effects of chemical treatments on microbiological, sensory and physical qualities of individually shrink-rapped produces. *J. Food Protect.* (50):673
- Grazia, L., Suzzi, G., Romano,P., and Giodici, P. 1989. The yeasts in meat products. *Yeasts* (5):S495.
- Green, M.D., and Ibe, S.N., 1987. Yeasts as primary contaminats in yogurt produced commercially in Logos. Nigeria. *J. Food Protech.* 950):193.
- Guan J. and Bruner J.R. 1987. Koumiss produced from skim milk sweet whey blend. *Cultured Dairy Journal*, 22(1): 23.
- Hsieh, D.Y., and Jay, J.M. 1984. Characterization and identification of yeasts from fresh and spoiled ground beef. *Int.J. Food Microbiol.*, 93):141.
- Jay, J., Loessner, M.J., Golden, D.A. 2005. *Modern Food Microbiology*, seventh ed., Springer, USA, pp 101-118.
- Jay, J., Loessner, M.J., Golden, D.A. 2005. *Modern Food Microbiology*, seventh ed., Springer, USA, pp 415-433.

- Jermini, M.F.G., Geigers, O., and Schimdt-Lorenz, W.M., 1987. Detection isolation and identification of osmotolerant yeasts from high-sugar products. *J. Food Protect.* (50):468.
- Johnson, D.A., Regner, K.M., and Lunden, J.D. 1989. Yeast soft rot of onion in the Walla valley of Washington. *Plant Dis.* (73):686.
- Kallmeyer, Moritz., 2005. Yeast Autolysis. Chief Brewer Drayman's Microbrewery, Silverton Pretoria, March 2005.
- Kurtzman, C.P. and J.W. Fell. 1998. The yeast. A Taxonomic Study, 4th edition, Elsevier, Amsterdam.
- Kurtzman, C.P., and Robnett, C.J., 1998. Identification and phylogeny of ascomycetous yeasts from analysis of large subunit (26S) ribosomal DNA partial sequences. *Antonie Van Leeuwenhoek* 78:331-371.
- Lenoir, J. 1984. The surface flora and its role in the ripening of cheese. *Int. J. Dairy Fed. Bull.* (171):3.
- Lodder J. 1970. *The Yeast: A Taxonomi Study*, North Holland Publishing Co.
- Lowry, P.D., and Gill, C.O., 1984. Development of yeast microflora on frozen lamb stored at -5°C. *J. Food Protect.* (47):309.
- Mambetaliev B.D., 1990. Production of Koumiss. USSR Patent. SU 1: 544, 341.
- Mian, M.A., Fleet, G.H., Hocking, A.D., 1997. Effect of diluent type on viability of yeasts enumerated from foods or pure culture. *Inten. Journal of Food Microbiology.* 35:103-107.
- Onishi, H. 1990. Yeasts in fermented foods. In, Spencer, J.F.T., and Spencer, D.M., (Eds.), *Yeast Technology*. Springer-Verlag, Berlin. P 167.
- Parish, M.E and Higgins, D.P., 1990. Investigation of the microbial ecology of commercial grapefruit sections. *J. Food Protech.*, (53):685.
- Pitt, J.I., and Hocking, A.H., 1997. *Fungi and Food Spoilage*, second edition, Blackie Academic & Professional, London.

- Pitt, J.I., and Hotchkings, A.D. 1988. Problem with preservative resistant yeasts. *Microbiol. Aliment. Nutr.* (6):19.
- Praphailong, W. 1996. Growth, metabolic and ultrastructural properties of food spoilage yeasts cultured under different environmental conditions. PhD Thesis, Department of Food Science and Technology, The University of New South Wales, Sydney NSW, Australia.
- Praphailong, W. and G.H. Fleet. 1997. The effect of pH, sodium chloride, sucrose, sorbate and benzoate on the growth of spoilage yeast. *Food Microbiol.*, 14:459-468.
- Publishing Co.
- Reed, G., and Nagodawithana, T.W., 1991. Technology of yeast usage in winemaking., *Am.J.Enol.Vitic.*, 39:83.
- Roostita R. 1993. Occurrence, Growth and Biochemical Properties of Yeasts in Cheeses and Milk. A Thesis, The University of New South Wales, Australia.
- Roostita R. and Fleet G.H. 1996. Growth of Yeasts in Milk and Associated Changes to milk Composition. *International Journal of Food Microbiology* 31: 205-219.
- Rose, A.H., and Harrison, J.S., 1993. The Yeasts, second edition, Vol. 5, Yeast Technology, Academic Press, London.
- Schmid, A., Dordick, J. S., Hauer, B., Kiener, A., Wubbolts, M. & Witholt, B. 2001. Industrial biocatalysis today and tomorrow. *Nature* 409: 258-268.
- Siward, R.F., Lee, B.H., Laley, C.L. and Holley, F.J. 1983. Effects of temperature, light and storage time on the microflora of vacuum or nitrogen-packed frankfurters. *J. Food Protect.* (46):199.
- Spencer, J.F.T., and Spencer, D.M., 1990. Yeast Technology., Springer Verlag, Berlin Heidelberg.
- Surajudin, Fauzi R. Kusuma, Dwi Purnomo., 2005. Yoghurt: *Susu Fermentasi yang Menyehatkan*, Jakarta: AgroMedia Pustaka.

- Tudor, E.A., Board, R.G., 1993. Foods Spoilage Yeasts, In: Rose, A.H., Horrison, J.S., (Eds), *The Yeast second edition volume 5. Yeast Technology*. Academic Press, London. Pp 435-516.
- Walker, G.M., 1998. *Yeasts physiology and biotechnology*. John Wiley and Sons, Chichester.
- Walker, H.W. and Ayres, J.C. 1970. Yeasts as spoilage organisms. In Rose, A.H., and Harrison, J.S., (Eds.). *The Yeast Vol 3, Yeast Technology*, Academic Press., London. P 463.
- Wart, A.D. 1989. Transport of benzoic and propanoic acids by *Zygosaccharomyces bailii*. *J. Gen. Microbiol* (135):1383.
- Wirahadikusumah, 1985. *Biokimia Pangan*, Institute Pertanian Bogor.
- Woolford, M.K., 1985. The silage fermentation, in *Microbiology of fermented foods*. Vol 2, Wood, B.J.B., eds., Elsevier., London p 85.

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