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Microbiology of Chinese Xuanwei ham production

By Aixiang Huang, Sarote Sirisansaneeyakul, Zongdao Chen, Shouchun Liu and Yusuf Chisti

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Literature references

1. BARNETT, J.A., R.W. PAYNE, D. YARROW and L. BARNETT (2000): Yeasts: Characteristics and identification. 3rd ed, Cambridge University Press, London.
2. CARRASCOSA, A.V. and I. CORNEJO (1991): Characterization of *Micrococcaceae* strains selected as potential starter cultures to Spanish dry-cured ham process: 2. Slow process. *Fleischwirtsch.* 71, 1187–1188.
3. CHEN, T.Sh. (1995): Production and application of microbial medium. China Agricultural Press, Beijing.
4. Chinese National Standard (2004): Health food microbiology testing. GB/T 4789.1-4789.31-2003, China Standard, Beijing.
5. Chinese National Standard (2004): Food hygienic methods of analysis – Physical and chemical section. GB/T 5009-2003, China Standard, Beijing.
6. COMI, G., S. ORLIC, S. REDZEPOVIC, R. URSO and L. IACUMIN (2004): Moulds isolated from Istrian dried ham at the pre-ripening and ripening level. *Intern. J. Food Microbiol.* 32, 185–197.
7. HINRICHSSEN, L. and S.B. PEDERSEN (1995): Relationship among flavor, volatile compounds, chemical changes, and microflora in Italian-type dry-cured ham during processing. *J. Agric. Food Chem.* 43, 2932–2940.
8. JAMES, M.J. (2001): Modern food microbiology. Aspen Publishers, Gaithersburg, Maryland.
9. JIANG, D.F., R.L. DUAN and P. MA (1990): Study of chemical compounds and microflora in Xuanwei style ham (in Chinese). *J. of Yunnan Univ.* 3, 71–75.
10. LI, P.L., Q.W. SHEN and Y.N. LU (2003): Investigation of major microbial composition of Xuanwei ham (in Chinese). *Chinese J. Microecology* 15 (5), 262–263.
11. LÜCKE, F.K. (1986): Microbiological processes in the manufacture of dry sausage and raw ham. *Fleischwirtsch.* 66, 1505–1509.
12. MARTÍN, A., J.J. CÓRDOBA, M.M. RODRÍGUEZ, F. NÚÑEZ and M.A. ASENSIO (2001): Evaluation of microbial proteolysis in meat products by capillary electrophoresis. *J. Appl. Microbiol.* 90, 163–171.
13. MARTÍN, M., J.J. CÓRDOBA, F. NÚÑEZ, M.J. BENITO and M.A. ASENSIO (2004): Contribution of a selected fungal population to proteolysis on dry-cured ham. *Int. J. Food Microbiol.* 94, 55–66.
14. NORTHOLT, M.D. and L.B. BULLERMAN (1982): Prevention of mould growth and toxin production through control of environmental condition. *J. Food Protec.* 45, 519–523.
15. NÚÑEZ, F., M.M. RODRÍGUEZ, J.J. CÓRDOBA, M.E. BERMÚDEZ and M.A. ASENSIO (1996): Yeast population during ripening of dry-cured Iberian ham. *Intern. J. Food Microbiol.* 29, 271–280.

16. NÚÑEZ, F., M.M. RODRÍGUEZ, M.E. BERMÚDEZ, J.J. CÓRDOBA and M.A. ASENSIO (1996): Composition and toxigenic potential of the mould population on dry-cured Iberian ham. *Intern. J. Food Microbiol.* **32**, 185–197.
17. RODRÍGUEZ, M., F. NÚÑEZ, J.J. CÓRDOBA, C. SANABRIN, E. BERMÚDEZ and M.A. ASENSIO (1994): Characterization of *Staphylococcus* spp. and *Micrococcus* spp. isolated from Iberian ham throughout the ripening process. *Intern. J. Food Microbiol.* **24**, 329–335.
18. ROJAS, F.I., M. JODRAL, F. GOSALVEZ and R. POZO (1991): Mycoflora and toxigenic *Aspergillus flavus* in Spanish dry-cured ham. *Intern. J. Food Microbiol.* **13**, 249–256.
19. SAMSON, R.A., B.S. HOEKSTRA, J.C. FRISVAD and O. FILTENBORG (1995): Introduction to food-borne fungi. 4th ed, Centralbureau voor Schimmelcultures, Baarn, The Netherlands.
20. SIMONCINI, N., D. ROTELLI, R. VIRGILI and S. QUINTAVALLA (2007): Dynamics and characterization of yeasts during ripening of typical Italian dry-cured ham. *Food Microbiol.* **24**, 577–584.
21. TOLDRA, F. (1998): Proteolysis and lipolysis in flavor development of dry-cured meat products. *Meat Sci.* **49**, 101–110.
22. VILAR, I., M.C. GARCÍA FONTÁN, B. PRIETO, M.E. TORNADIJO and J. CARBALLO (2000): A survey on the microbiological changes during the manufacture of dry-cured lacón, a Spanish traditional meat product. *J. Appl. Microbiol.* **89**, 1018–1026.
23. WANG, X.H., P. MA, D.F. JIANG, Q. PENG and H. YA (2006): The natural microflora of Xuanwei ham and the no-mouldy ham production. *J. Food Engin.* **77**, 103–111.
24. YU, Z.S., W.X. JIANG, C.Y. QIU and M.Y. FAN (2005): History of development of Xuanwei ham. The Proceedings of the 5th Chinese Congress of Meat Science, pp. 264–265.

Authors' addresses

Aixiang Huang (corresponding author) and Shouchun Liu, Faculty of Food Science and Technology, Yunnan Agricultural University, Kunming 650201, P.R. China; Sarote Sirisansaneeyakul, Department of Biotechnology, Kasetsart University, Bangkok 10900, Thailand; Zongdao Chen, Faculty of Food Science, Xinan University, Chong Qing 400716, P.R. China and Yusuf Chisti, School of Engineering, Massey University, Private Bag 11 222, Palmerston North, New Zealand; aixianghuang@126.com