

## **BAB VI PENUTUP**

### **6.1. Kesimpulan**

1. Perbedaan konsentrasi susu skim memberikan pengaruh nyata terhadap viabilitas BAL yoghurt kolostrum susu sapi.
2. Semakin tinggi konsentrasi susu skim yang ditambahkan maka Total BAL meningkat yang dapat dilihat pada Konsentrasi susu skim sebesar 4% menunjukkan peningkatan total BAL paling tinggi, tetapi pada konsentrasi susu skim paling tinggi terjadi penurunan total BAL.
3. Berdasarkan hasil penelitian dapat diketahui nilai total BAL yoghurt kolostrum berkisar 9,9523-10,6005 log cfu/mL atau  $8,96.10^9$ - $3,99.10^{10}$  cfu/mL.

### **6.2. Saran**

Perlu dilakukan uji lama penyimpanan untuk viabilitas BAL yoghurt kolostrum susu sapi

## DAFTAR PUSTAKA

- Ahmadi, M., A. B. Velcirov., M. Scurtu., T. Ahmadi dan L. Olariu. 2011. Benefits of Bovine Colostrum in Nutraceutical Products, *Journal of Agroalimentary Processes and Technologies*. 17 (1): 42-45.
- Aldridge, B. M., F. B. Garry dan R. Adams. 1992. Neonatal septicaemia in calves, *JAVMA*. 203(9): 1324 – 1329.
- Anema, S. G., Y. Li. 2003. Effect of pH on the association of denatured whey proteins with casein micelles in heated reconstituted skim milk, *Journal of Agriculture and Chemistry*. 51(6): 1640-1646.
- Anue, T. M. dan E. L. Thomas. 1978. Oxidation of protein sulfhydryls by products of peroxidase-catalyzed oxidation of thiocyanate ion. *Biochemistry*. 17: 1005-1010.
- Apriyantono, A., D. Fardiaz, N. L. Puspitasari, Sedarmawati dan S. Budiyo. 1989. *Petunjuk Laboratorium Analisa Pangan*. Bogor: Pusat Antar Universitas Pangan dan Gizi Institut Pertanian Bogor.
- Arthington, J. 1999. Colostrum Management in newborn calves. *The Florida Cattleman and Livestock Journal*.
- Badan Pengawasan Obat dan Makanan. Surat Keputusan KA. Badan POM RI No.: HK.00.05.52.4040. Tanggal: 9 Oktober 2006 Tentang Kategori Pangan. [http://www2.pom.go.id/public/hukum\\_perundangan/pdf/COMBINE\\_03032011.pdf](http://www2.pom.go.id/public/hukum_perundangan/pdf/COMBINE_03032011.pdf). (16 April 2013)
- Badan Standarisasi Nasional. *SNI 2981:2009: Yogurt*. [http://sisni.bsn.go.id/index.php?/sni\\_main/sni/detail\\_sni/10235](http://sisni.bsn.go.id/index.php?/sni_main/sni/detail_sni/10235). (4 April 2013).
- Badan Standarisasi Nasional. *SNI 3141.1:2011: Susu Segar: Bagian 1-Sapi*. [http://sisni.bsn.go.id/index.php?/sni\\_main/sni/detail\\_sni/11914](http://sisni.bsn.go.id/index.php?/sni_main/sni/detail_sni/11914). (16 April 2013).
- Badan Standardisasi Nasional. 1998. *SNI Susu Segar* ( SNI 01-3141-1998). Dewan Standarisasi Nasional : Jakarta.

- Björck, L., C. G. Rosen., V. Marshall dan B. Reiter. 1975. Antibacterial activity of the lactoperoxidase system in milk against pseudomonads and other Gram-negative bacteria, *Appl. Microbiol.* 30: 199.
- Buchanan, R. E. dan N. E. Gibson. 1974. *Bergeys Manual of Determination Bacteriology 8<sup>th</sup> edition*. Baltimore: The Williams and Wilkins Company.
- Buckle, K. A., R. A. Edwards., G. H. Fleet dan M. Wootton. 2009. *Ilmu Pangan*. Penerjemah: Hari Purnomo dan Adiono. Jakarta: UI Press.
- Blum, J. W. dan H. Hammon. 2000. Colostrum effects on the gastrointestinal tract, and on nutritional, endocrine and metabolic parameters in neonatal calves. *Livestock Production Science.* 66, 151-159
- Bourdy, C., J. P. Dehoux., D. Portetelle dan A. Buldgen. 2008. Bovine colostrum as a natural growth promoter for newly weaned piglets: a review, *Biotechnol Agron Soc Environ.* 12(2):157-170.
- Cesarone, M. R., G. Belcaro., A. Di Renzo., M. Dugall., M. Cacchio., I. Ruffini., L. Pellegrini., G. Del Boccio., F. Fano., A. Ledda., A. Bottari., A. Ricci., S. Stuard dan Vinciguerra. 2007. Prevention of Influenza Episodes With Colostrum Compared With Vaccination in Healthy and High-Risk Cardiovascular Subjects: The Epidemiologic Study in San Valentino, *Clin Appl Thromb Hem.* 13(2):130-136.
- Chandan R. C. dan K. M. Shahani, 1993. Yogurt, (dalam *Dairy Science and Technology Handbook. 2. Product Manufacturing*. Y. H. Hui, Ed.), VCH, Pub., Inc., USA.
- Chandan, R. C., (Ed). 2006. *Manufacturing Yogurt and Fermented Milks*. Iowa: Balckwell Publishing.
- Codex Alimentarius. 2008. *Codex Standart For Fermented Milk CODEX STAND 243*. Food Agriculture Organization.
- Commission Regulation (EC) No 1662/2006 of 6 November 2006 amending Regulation (EC) No. 853/2004 of the European Parliament and of the Council laying down specific hygiene rules

for food of animal origin. *Official Journal of the European Union*  
No L 320 18.11.2006

- Connely, O. M. 2001. Antiinflammatory Activities of Lactoferrin (review), *J Am Coll Nut* 20 (2): 389S-395S.
- Conte, F. dan Scarantino, S. 2013. A Study on The Quality of Bovine Colostrum: Physical, Chemical and Safety Assessment, *Int. Food Research J.* 20 (2): 925-931.
- DeMan, J. M. 1997. *Kimia Makanan*. Bandung: Penerbit Institut Teknologi Bandung.
- Effendi, H. M. S. 2009. *Teknologi Pengolahan dan Pengawetan Pangan*. Bandung: Alfabeta.
- Elfstrand, L., H. L. Mansson., M. Paulsson., L. Nyberg dan B. Akesson. 2002. Immunoglobulins, growth factors and growth hormone in bovine colostrum and the effects of processing, *Int Dairy J.* 12:879-887.
- Eniza, S. 2004. "Teknologi Pengolahan Susu dan Hasil Ikutan Ternak". Universitas Sumatera Utara.
- Fardiaz, S. 1989. *Mikrobiologi Pangan: Penuntun Praktek Laboratorium*. Bogor: IPB Jurusan Teknologi Pangan dan Gizi.
- Farkey, N. Y. 2002. "Other Enzymes," (dalam *Encyclopedia of Dairy Sciences*, H. Roginski, J. W. Fuquay, P. F. Fox Ed.) Amsterdam: Academic Press, vol. 3, pp. 946-947.
- Fellows P. 1990. *Food Processing Technology Principles and Practice*. New York : Ellis Hawood.
- Foley, J. A. dan D. E. Otterby. 1978. Availability, Storage, Treatment, Composition, and Feeding Value of Surplus Colostrum: a Review. *J Dairy Sci*, 61: 1033-1060.
- Food Standards Australia New Zealand. *Yogurt, Natural, Regular Fat (3,5%)*. <http://www.foodstandards.gov.au/consumerinformation/nuttab2010/nuttab2010onlinerearchabledatabase/onlineversion.cfm?&action=getFood&foodID=09C10088>. (8 April 2013).

- Fox, P. F. dan A. L. Kelly. 2006. Indigenous enzymes in milk: overview and historical aspects. Part 2., *International Dairy Journal*. **16**, 517–532.
- Fox, P. F., T. P. Guinee., T. M. Cogan., P. L. H. McSweeney. 2000. *Fundamental of Cheese Science*. An Aspen Publication, Maryland
- Georgiev, I. P. 2008, Differences in chemical composition between cow colostrum and Milk. *Bulgarian journal Of Veterinary Medicine*, 11(1): 3-12
- Gopal, P. K. dan H. S. Gill. 2000. Oligosaccharides and glycoconjugates in bovine milk and colostrum. *British Journal of Nutrition*, **84**, Suppl !, S69-S74
- Green, L., S. Godden., J. Feirtag. 2003. Effect of batch and high temperature-short time pasteurization on immunoglobulin G concentrations in colostrum (*Abstract*). *J Dairy Sci*. **86** (Suppl. 1):246.
- Hadiwiyoto, S. 1994. *Teori dan Prosedur Pengujian Mutu Susu dan Hasil Olahannya*. Yogyakarta : Liberty.
- Hekmati, M. dan K. Niromand. 1978. Comparative Study and Variations of Colostral Milk Component in Foreign and Native Breeds in Iran. *Milchwissenschaft*, **33**: 24-27
- Helferich, W. dan D. Westhoff. 1980. *All About Yogurt*. Practice Hall Inc., New Jersey.
- Herawati, D. A. dan D. Andang Arif Wibawa. 2011. Pengaruh Konsentrasi Susu Skim Dan Waktu Fermentasi Terhadap Hasil Pembuatan Soyghurt. *Jurnal Ilmiah Teknik Lingkungan* **1** (2).
- Hurley, W. L. *The neonate and colostrums*, ANCSI 308, Department of Animal Sciences, University of Illinois, Urbana-Champaign ([http://nutriweb.org.my/publications/mjn0010\\_1/mjn10nl.art1.pdf](http://nutriweb.org.my/publications/mjn0010_1/mjn10nl.art1.pdf))
- Hui, Y. H., (Ed.) 1991. *Encyclopedia of Food Science and Technology Vol. 4*. USA: A Wiley-Interscience Publications.
- Hui, Y. H. 1992. *Dairy Science and Technology Handbook volume 1: Principles and Properties*. New York: VCH Publishers, Inc.

- Hui, Y. H. 1993. *Dairy Science and Technology Handbook Volume 2: Product Manufacturing*. New York: VCH Publishers, Inc.
- Houser, B. A., S. C. Donaldson., S. I. Kehoe., A. J. Heinrichs dan B.M. Jayarao. 2008. A Survey of Bacteriological Quality and the Occurrence of *Salmonella* in Raw Bovine Colostrum, *Foodborne Pathogens and Disease*. 5 (6): 853-858.
- Hutkins, R. W. 2006. *Microbiology and Thechnology of Fermented Food First edition*. USA: Blackwell Publishing
- Kanyshkova, T. G., S. E. Rabina., D. V. Semenov., N. Isaeva., A. V. Vlassov., K. N. Neustroev., A. A. Kulminskaya., V. N. Buneva., G. A. Wevinsky. 2003. Multiple Enzymatic Activities of Human Milk Lactoferrin, *eur j biochem* 270: 3353-3361.
- Karen, J. L., W. Hong., A. Mueen., S. Zou dan L. H. Walter. 1996. Antimicrobial proteins in milk, *Illinois Dairy Report*. ANSCI 308.
- Kehoe, S. I., B.M. Jayara dan A. J. Heinrichs. 2007. A survey of bovine colostrum composition and colostrum management practices on Pennsylvania dairy farms, *Journal of Dairy Science*. 90: 4108-4116.
- Kelly, G. S. 2003. Bovine colostrums: A review of clinical uses. *Altern. Med. Rev.*, 8: 378-394.
- Korhonen, H., P. Marnila dan H. S. Gill. 2000a. Bovine milk antibodies for health, *Br J Nutr*. 84:35-46.
- Korhonen, H., P. Marnila dan H. S. Gill. 2000b. Milk immunoglobulins and complements factor, *Br J Nutr*. 84:S75-80.
- Korhonen, H. 2009. Bioactive components in bovine milk. (dalam *Bioactive Components in Milk and Dairy Products* (ed. Y. Park), pp. 15–42). Wiley-Blackwell, Ames, IA.
- Kroger, M. 1975. Quality of Yogurt, *Journal of Dairy Science*. 4868.
- Kulkarni, P. R. dan P. A. Pimpale. 1989. Colostrum a review. *Indian J Dairy Sci*. 42: 216-224

- Kussendrager, K. D. dan A. C. M. Van Hooijdkank. 2000. Lactoperoxidase: physico-chemical properties, occurrence, mechanism of action and applications, *British J. of Nutrition*. 84 (supplement 1): 19-25.
- Landge, V. L. 2009. Quality of Yogurt Supplemented with Whey Protein Concentrate and Effects of Whey Protein Denaturation *M.Sc. Thesis*. Kansas State University, Kansas
- Larson, B. L. 1992. Immunoglobulins of the mammary secretions, (dalam *Advanced Dairy Chemistry. Proteins*, Volume 2, P.F. Fox, ed), Elsevier Applied Science, London. pp. 231–254.
- Lazzaro, J. 2000. *Colostrum/Suplementing Colostrum*. [wichway@saanedoah.com](mailto:wichway@saanedoah.com) [25 Oktober 2013].
- Limsonwitin, G. 1992. Inhibition of starter cultures, *Aust. J. Dairy Technol.* 47: 100.
- Lissner, R., P. A. Thurmann., G. Merz dan H. Karch. 1998. Antibody reactivity and fecal recovery of bovine immunoglobulins following oral administration of a colostrum concentrate from cows (lactobin) to healthy volunteers, *Int J Clin Pharmacol Ther.* 36: 239-245
- Lee, W. J. dan J. A. Lucey. 2004. Structure and Physical Properties of Yogurt Gels: Effect of Inoculation Rate and Incubation Temperature, *J. Dairy Sci.* 87:3153-3164.
- Losnedahl, K. J., H. Wang., M. Aslam., S. Zou dan W. L. Hurley. 1998. Antimicrobial factor in milk. [terhubung berkala]. <http://www.livestocktrail.uiuc.edu/dairy/paperDisplay.cfm?ContentID=229> [25 Oktober 2013].
- Mahdian E and Tehrani MM (2007). Evaluation the Effect of Milk Total Solids on the Relationship between Growth and Activity of Starter Cultures and Quality of Concentrated Yoghurt. *American-Eurasian Journal of Agriculture and Environmental Science* 2 587-592.
- Mayer, G. 2009. Immunoglobulin-structure and function. <http://pathmicro.med.sc.edu/mayer/igstruct2000.htm> [25 Oktober 2013].

- McMartin, S., S. Godden., L. Metzger., J. Feirtaq., R. Bey., J. Stabel., S. Goyal., J. Fetrow., S. Wells dan H. C. Jones. 2006. Heat treatment of bovine colostrum. I: effect of temperature on viscosity and immunoglobulin G level, *J Dairy Sci* 89(6):2110-2118.
- Meylan, M., M. Rings., W. P. Shulaw., J. J. Kowalski., S. Bech-Nielsen dan G. F. Hoffsis. 1995. Survival of *Mycobacterium paratuberculosis* and preservation of immunoglobulin G in bovine colostrum under experimental conditions simulation pasteurization, *Am J Vet Res* 57:1580-1585.
- Mitoma, M., T. Oho., Y. Shimazaki., T. Koga. 2001. Inhibitory Effect of Bovine Milk Lactoferrin an the Interaction Between a Streptococcal Surface Protein Antigen and Human Salivary Agglutinin, *J Bio chem* 276 (21): 18.060-18.065.
- Mitsuoka, T. 1989. *Microbes in The Intensine*. Yakult Honda Co. Ltd, Tokyo
- Moeljanto, R. D. dan B. T. W. Wiryanta. 2002. *Khasiat dan Manfaat Susu Kambing: Susu Terbaik dari Hewan Ruminansia*. Tangerang: Agro Media Pustaka.
- Nighswonger, B.D. Brashears and S.E. Gilliland. 1996. *Viability of Lactobacillus acidophilus and Lactobacillus casei In fermented Milk Products During Refrigerated Storage*. *Journal of Dairy Science*. 79:212-219.
- Ohiokpehai, O. 2003. Processed Food Products and Nutrient Composition of Goat Milk, *Pakistan. J. Nutr.* 2 (22): 68-71.
- Ong, R. 2007. Penentuan Kadar Kolostrum Optimal bagi Produksi Yogurt Kolostrum Sapi dengan Kultur Campuran: *Lactobacillus bulgaricus*, *Streptococcus thermophilus*, *Lactobacillus casei strain Shirota*, dan *Bifidobacterium breve*, *Thesis S-2*, Fakultas Bioteknologi universitas Atma Jaya, Jakarta.
- Ontsouka, C. E., R. M. Bruckmaier dan J. W. Blum. 2003. Fractionized milk composition during removal of colostrum and mature milk, *Journal of Dairy Science*. 86: 2005-2011.
- Ouwenhand, A. C., B. B. Salvadori., R. Fonden., G. Mogensen., S. Salminem dan R. Sellar., 2003. Health Effect of Prebiotics and



- Culture Containing Dairy Products in Human. *Bulletin of the IDF*. 380: 4-16.
- Pakkanen, R. dan J. Aalto. 1997. Growth factors and antimicrobial factors of bovine colostrum – review paper. *Int. Dairy J.*: 285–297.
- Pandey, N. N., A. A. Dar., D. B. mondal dan L. Nagaraja. 2011. Bovine Colostrum: A Veterinary Nutraceutical: a Review. *Journal of Veterinary Medicine and Animal Health*. Vol 3(3), pp, 33-35
- Parekh, T. S dan R. Subhash. 2008. Molecular and Bacteriological Examination of Milk from Different Milch Animals With Special Reference to Coliform Curr. *Res. Bacteriol.*, 1 (2): 56-63.
- Pellegrini, A., U. Thomas., R. Von Fellenberg dan P. Wild. 1992. Bactericidal Activities of Lysozim and Aprotinin Against Gram-negative and Gram-positive bacteria Related to their Basic Character, *Journal of Applied Bacteriology*. 72: 180-187.
- Pruitt, K. M. dan B. Reiter. 1985. *Biochemistry of Peroxidase system* (dalam *the Lactoperoxidase System Chemistry and Biological Significance*.. K. M. Pruitt and J. Tenovuo, Eds). PP.143-178. New York: Marcel Dekker.
- Rahman, A., S. Fardiaz, W. T. Raharju, Suliantari dan C. C. Nurwitri. 1992. *Teknologi Fermentasi Susu*. Bogor: Depdikbud dan Dirjen Dikti PAU Pangan dan Gizi IPB.
- Rice D. N., Rogers D. G. 1990. Colostrum quality and absorption in baby calves, NebGuide, File G987, under BEEF, A-41, *Feeding and Nutrition*, Issued May 1990, Publ. by Cooperative Extension, Institute of Agricultural and Natural Resources, University of Nebraska-Lincoln ([pubs@unl.edu](mailto:pubs@unl.edu)).
- Robinson, R. K. 2002. Yoghurt, Role of Starter Cultures, (dalam *Encyclopedia of Dairy Science*, H. Roginski, J. Fuquay dan P. Fox, Ed.) Academic Press, United Kingdom, 1059-1063.
- Rucketbusch, Y., L. P. Phaneuf dan R. Dunlop. 1991. *Physiology of small and Large Animals*. Philadelphia-Hamilton: B.C. Decker, Inc.
- Saputra, F. 2008. Perbandingan Komposisi dan Daya Antimikroba antara Susu Sapi Segar (UHT), Kolostrum Sapi Segar dan Kolostrum

- Sapi Bubuk, *Skripsi S-1*, Universitas Katolik Indonesia Atma Jaya, Fakultas Teknobiologi, Jakarta.
- Sawitri, M. E., Manab, A., Palupi, T. W. L. 2008. Kajian Penambahan Gelatin Terhadap Keasaman, pH, Daya Ikat Air dan Sineresis Yoghurt, *Jurnal Ilmu dan Teknologi Hasil Ternak*. 3(1): 35-42.
- Schanbacher, F. L., R. E. Goodman., R. S. Talhouk. 1993. Bovine Mammary Lactoferrin: Implications from Messenger Ribonucleic Acid (Mrna) Sequence and Regulation Contrary to Other Milk Proteins, *J Dairy Sci* 76: 3812-3831.
- Seifu , E., E. M. Buys dan E. F. Donkin. 2005. Significance of the lactoperoxidase system in the dairy industry and its potential applications: a review. *Trends in Food Science and Technology* 16 : 137 – 154 .
- Seveline. 2005. Pengembangan Produk Probiotik dari Isolat Klinis Bakteri Asam Laktat dengan Menggunakan Teknik Pengeringan Semprot dan Pengeringan Beku, *Thesis*, Sekolah Pascasarjana Institut Pertanian Bogor, Bogor.
- Shrinivas, B., P. Rajesh dan S. Manisha. 2010. Colostrum: All in one Medicine, int. *Journal of Pharmacy and Pharmaceutical Sciences*, Vol 2, Suppl 1.
- Solomon, N. W. 2002. Modulation of the Immune System and the Response Against Pathogens with Bovine Colostrum Concentrates. *European Journal of Clinical Nutrition*. 56, Suppl 3, S24-S28.
- Stabel, J. R., S. Hurd., L. Calvente dan R. F. Rosenbusch. 2004. Destruction of *Mycobacterium paratuberculosis*, *salmonella* spp., and *Mycoplasma* spp. in raw milk by a commercial onfarm high-temperature, short-time pasteurizer, *J Dairy Sci* 87:2177–2183.
- Stelwagen, K., E. Carpenter, B. Haigh, A. Hodgkinson and T. T. Wheeler. 2009. *Immune Components of Bovine colostrum and milk*. *J. anim Sci*, 87:3-9
- Suparno. 1992. *Prinsip Kimia dan Teknologi Susu*. Yogyakarta : UGM Press.

- Surajudin, Fauzi R., dan D. Purnomo. 2004. *Yoghurt Susu Fermentasi yang Menyehatkan*. Jakarta: AgroMedia.
- Tamime, A. Y. 2006. *Fermented Milks*. England: Blackwell Science LTD.
- Tamime, A. Y. dan R. K. Robinson. 1999. *Yogurt Science and Technology second edition*. England: Woodhead Publishing Limited
- Tamime, A. Y. dan R. K. Robinson. 2007. *Yoghurt Science and Technology Third Edition*. England: Woodhead Publishing Limited.
- Tamime, A. Y. dan H. C. Deeth. 1980. Yoghurt: Technology and Biochemistry, *J. Food Protect. Vol 43* (12): 939-977.
- Thapa, B. R. 2005. Therapeutic potentials of bovine colostrums. *Ind J Pediatr*, 72: 849-852.
- Wahyudi, M. 2006. Proses Pembuatan dan Analisis Mutu Yoghurt. *Buletin Teknik Pertanian* 11 (1), 2006.
- Walstra, P., R. Jenness. 1983. *Dairy Chemistry and Physics*. New York: John Wiley and Sons, Inc.
- Walstra, P., Geurts, T.J., Noomen, A., Jellema, A dan Van Boekel, M.A.J.S. 1999. *Dairy Technology – Principles of Milk Properties and Processes*. New York: Marcel Dekker.
- Walstra, P., Jan T. M. Wouter dan T. J. Geurts. 2006. *Dairy Science and Technology 2<sup>nd</sup> ed*. USA: CRC press.
- Widodo, W. 2002. *Bioteknologi Fermentasi Susu*. Malang : Pusat Pengembangan Bioteknologi Universitas Muhammadiyah [http://wahyuwidodo.staff.umm.ac.id/files/2010/01/FERMENTAS\\_ISUSU.pdf](http://wahyuwidodo.staff.umm.ac.id/files/2010/01/FERMENTAS_ISUSU.pdf) (20 oktober 2013).
- Winarno, F. G., Ahnan, W. W dan Widjajanto, W. 2003. *Flora Usus dan Yogurt*. Bogor: M-Brio Press.
- Winarno, F. G. dan Fernandez, I. E. 2007. *Susu dan Produk Fermentasinya*. Bogor: M-Brio Press

- Wolfson, L.M. dan S. S. Sumner., 1993. Antibacterial activity of the lacoberoxidase system: a review, *J. Food Prot.* 56: 887.
- Yamaguchi, Y., M. Semmel., L. Stanislawski., A.D. Strosberg dan M. Stanislawski. 1993. Virucidal Effects of Glucose Oxidase and Peroxidase or Their Protein Conjugates on Human Immunodeficiency VirusType 1, *Antimicrobial Agents and Chemotherapy.* 37: 26-31.
- Yoguchi, H., T. Goto dan S. Okonagi. 1992. Fermented Milks, Lactic Drinks and Intestinal Microflora. (dalam Nakazawa, Y. dan Hosono, A. (eds). *Function of Fermented Milk, Chalange for The Health Science*, hlm 247). *Elsevier Applied Science*, New York.
- Vasbinder, A. J., C. G. de Kruif. 2003. Casein-whey protein interactions in heated milk: The influence of pH, *International Dairy Journal.* 13(8): 669-677.