

**Paul S. Kindstedt**  
***Curriculum Vitae***

Department of Nutrition and Food Sciences  
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University of Vermont  
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**EDUCATION**

Doctor of Philosophy, Food Science, 1986 - Cornell University  
Master of Science, Animal Science, 1981 - University of Vermont  
Bachelor of Science, Dairy Technology (Summa Cum Laude), 1979 - University of Vermont  
University of Chicago (Dean's List), 1975-1976

**EMPLOYMENT**

Acting Chair

Department of Nutrition and Food Sciences, University of Vermont  
October, 2014 to May, 2015

Co-Director

Vermont Institute for Artisan Cheese  
March, 2004 to June, 2013

Coordinator

Competitive Hatch Program, Vermont Agricultural Experiment Station, University of Vermont  
July, 2001 to June, 2004

Associate Director

Northeast Dairy Foods Research Center, University of Vermont  
January, 1999 to June, 2004

Professor

Department of Nutrition and Food Sciences, University of Vermont  
July, 1996 to present

Current teaching responsibilities include NFS 050 (Cheese and Culture) and NFS 195 (Principles of Cheesemaking). Areas of research and scholarship include cheese chemistry and crystallography; cheese history

Associate Professor

Department of Animal and Food Sciences, University of Vermont  
July, 1991 to June, 1996

Assistant Professor

Department of Animal Sciences, University of Vermont  
January, 1986 to June 1991.

<b>HONORS AND AWARDS</b>
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2022 – Babcock Award for Exemplary Service in Educating and Training the United States Dairy Industry. Wisconsin Cheese Makers Association  
2021 – President, American Dairy Science Association Foundation  
2020 – Elected Vice President, American Dairy Science Association Foundation  
2019 – Appointed Chair of the Board of Trustees, American Dairy Science Association Foundation  
2018 – International Dairy Foods Association Research Award in Dairy Foods Processing, American Dairy Science Association.  
2018 – The Hawley Award for best 2017 article published in The Canadian Mineralogist, Mineralogical Association of Canada  
2014 to 2017 – Elected to Board of Directors, American Dairy Science Association  
2012 – Honorary Member, World-wide Traditional Cheeses Association  
2008 – Kraft Foods Teaching Award in Dairy Manufacturing, American Dairy Science Association  
2007 – Keynote Speaker, New York Academy of Sciences, Manhattan, May 10<sup>th</sup>  
2007 – Keynote speaker, American Cheese Society 24<sup>th</sup> Annual Meeting  
2004 – First Honorary Lifetime Member, Vermont Cheese Council  
2004 – UVM-CALS R.L. Bickford Keystone Award in Nutrition and Food Sciences  
1999 – Bickford Scholar, College of Agriculture and Life Sciences, University of Vermont  
1999 - Vermonters Pursuing Excellence, University of Vermont  
1997 - College of Agriculture and Life Sciences Alumni New Achiever Award, University of Vermont  
1996 – Senior Fellowship, Commonwealth Scientific and Industrial Research Organization, Australia  
1993 – Pfizer Award in Cheese and Cultured Products Research, American Dairy Science Association  
Outstanding Teaching Assistant, 1985, Department of Food Science, Cornell University  
Phi Kappa Phi (1984)  
Sigma Xi (1980)  
American Dairy Science Association Graduate Student Paper Competition, Dairy Foods Research Division, 1983 - 3rd place  
New York Section IFT Fellowship, 1983

Forbes Award for outstanding undergraduate student in the field of dairy manufacturing, 1979, University of Vermont

## **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

American Cheese Society; First Vice President, 1983-1984  
American Dairy Science Association; Board of Directors, 2014 to 2017  
Vermont Dairy Industry Association; Board of Directors, 2010 to 2019;  
Secretary, 2013 to 2019  
Vermont Cheese Council, founding affiliate member and technical advisor;  
Honorary Lifetime Member

## **INTERNATIONAL EXPERIENCE**

**1989** - Visting Scientist to Sweden, hosted by Svenska Mejeriernas Riksforening (SMR-Swedish Dairies Association). Conducted Mozzarella cheese development trials at the Norrmejerier cheese plant in Umea, Sweden.

**1990** – USDA-funded Collaborative research with the National Dairy Products Research Centre, Moorepark, Ireland. Conducted cheese making trials at Moorepark examining the role of milk seasonality on functional characteristics of Mozzarella cheese.

**1991** - Visiting Expert to P.R. China, hosted by Northeast Agricultural University, Harbin. Presented seminar series on advanced dairy technology to Chinese industry representatives in Harbin and Beijing.

**1992** - Visting Scientist to Sweden, hosted by Svenska Mejeriernas Riksforening (SMR-Swedish Dairies Association). Presented seminars on cheese technology for SMR in Lund and at the cheese research station at Falkenberg.

**1993** - Speaker at the International Dairy Federation *Seminar on Cheese Yield* in Cork, Ireland.

**1994** – Invited speaker, Wannan Medical College, Anhui, P.R. China. Presented seminar entitled "Critical aspects of nutrition for the newborn infant". Seminar was videotaped and translated into Chinese for broader distribution in China.

**1996** - Visiting Scientist to New Zealand, hosted by the New Zealand Dairy Research Institute.

**1996** - Senior Fellow, Commonwealth Scientific and Industrial Research Organization, Australia.

**1997** - Invited speaker, *Fourth Cheese Symposium*, Cork, Ireland, Sponsored by the National Dairy Products Research Centre, Moorepark, and the University College Cork.

**1997** - Visiting Scientist/Senior Fellow, Commonwealth Scientific and Industrial Research Organization, Australia.

**1997** - Invited keynote speaker, *Seminar on Pizza Cheese*, Rio De Janereio, Brazil (a national conference sponsored by Chr. Hansen's Laboratories, Inc., Brazil)

**1998** - Invited keynote speaker, *Cheese Science 98*, Melbourne, Australia (an international conference on cheese science, jointly organized by the Australian

Starter Culture Research Centre, CSIRO Div. of Food Sci. and Technol., and University of Melbourne)

**2001-2003** - USDA-funded Collaborative research with University College Cork, Ireland. Enhancing safety and expanding markets for farmstead cheese produced in the US and Ireland through focus on microbiological and chemical parameters

**2003** – Invited Keynote speaker, *40 Years of Dairy Chemistry – A Major International Symposium*, Cork, Ireland (jointly organized by University College Cork and National Dairy Products Research Center, Teagasc)

**2006** – Invited Keynote speaker, *Cheese Art 2006, 5<sup>th</sup> Biennial event of Culture and Science of Traditional Dairy Productions of Mediterranean Countries*, Ragusa, Sicily

**2012** – Invited speaker and honorary membership recipient, 1<sup>st</sup> Congress, World-wide Traditional Cheeses Association, Ragusa, Sicily

**2014** – Invited Keynote Speaker, Ninth Cheese Symposium, Cork, Ireland, November 12, 2014

**2018** – Invited Keynote Speaker, Tenth Cheese Symposium, Rennes, France, April 4-6, 2018

**2019** – Invited Keynote Speaker, World Dairy Summit, International Dairy Federation, Istanbul, Turkey, September 24, 2019

## **GRADUATE STUDENT THESES AND DISSERTATIONS**

McConnell, S.L. 1993. Thermal Stability of Milk Clotting Enzymes. M.S. thesis.

Zhang, B. 1995. Effect of Freezing Rate on Proteolysis, Functional Characteristics, and the Water Phase of Low-Moisture Part-Skim Mozzarella Cheese. M.S. thesis

Wang, W. 1995. Compositional and Functional Changes in Mozzarella Cheese Stored in Refrigerated Pizza. M.S. thesis

Dixon, P. 1999. The Effect of Seasonal Milk Production on Cheddar Cheese Composition, Quality and Yield. M.S. thesis

Ouelette, R. 2000. Strategies to Improve the Functional Stability of Mozzarella Cheese Used as an Ingredient for Refrigerated Pizza. M.S. thesis

Hendricks, G. 2001. Processing effects on the distribution and bioavailability of essential minerals in infant formula. Ph.D. dissertation

Lee, F. 2002. Physico-chemical contributions of milkfat to the functional and structural properties of mozzarella cheese. Ph.D. dissertation

Acosta, L. 1998. Evaluation of the Serum Phase of Cream Cheese. M.S. thesis

Ge, Qinghua. pH-induced changes in the functional and physico-chemical characteristics of mozzarella cheese. M.S. Thesis

Cortez, M. 2002. Influence of pH and calcium distribution on the aging behavior of Mozzarella cheese. Ph.D. dissertation

Rajbhandari, P. 2005. Calcium lactate crystallization on smoked Cheddar cheese and its quantitative measurement by image analysis. M.S. Thesis

Losambe, A.N. 2008. Evaluation of Microbiological causes of syneresis defect in Cream cheese. M.S. thesis  
Valentine, E. 2008. Effect of packaging conditions on growth kinetics and structure of calcium lactate crystals in Cheddar cheese. M.S. thesis  
Patel, J. 2008. Effect of storage temperature on growth kinetics  
Rajbhandari, P. 2009. A mechanistic approach to understanding key parameters associated with calcium lactate crystallization on Cheddar cheeses using image analysis. Ph.D. dissertation  
Tansman, G. 2014. Exploring the nature and cause of crystals in cheese with X-ray diffraction. M.S. thesis  
Tansman, G. 2017. Development and implementation of methods to study crystallization in cheese. Ph.D. dissertation  
Polowsky, P. 2018. Analysis of surface crystals on soft washed rind cheeses using polarized light microscopy and their effect on the sensory perception of grittiness. M.S. Thesis

## **PUBLICATIONS:**

### Refereed Journal

**Kindstedt, P.S.**, A.H. Duthie, and K.M. Nilson. 1983. Estimation of casein from total protein in commingled milk. *J. Dairy Sci.* 66:2459-2463.  
**Kindstedt, P.S.**, L.R. Mattick, and F.V. Kosikowski. 1983. Simple selective sodium ion electrode measure of sodium in cheese. *J. Dairy Sci.* 66:988-993.  
**Kindstedt, P.S.**, A.H. Duthie, and K.M. Nilson. 1984. Casein affects cheese yields and profits. *Cult. Dairy Prod. J.* 19(1):20-23.  
**Kindstedt, P.S.**, and F.V. Kosikowski. 1984. Measurement of sodium chloride in cheese by a simple sodium ion electrode method. *J. Dairy Sci.* 67:879-883.  
**Kindstedt, P.S.**, and F.V. Kosikowski. 1985. Alternative test for phosphorus in cheese. *J. Dairy Sci.* 68:1859-1864.  
**Kindstedt, P.S.**, and F.V. Kosikowski. 1985. Improved complexometric determination of calcium in cheese. *J. Dairy Sci.* 68:806-809.  
**Kindstedt, P.S.**, and F.V. Kosikowski. 1988. Calcium, phosphorus and sodium concentrations in Cheddar cheese. *J. Dairy Sci.* 71:285-289.  
**Kindstedt, P.S.**, J.K. Rippe, and C.M. Duthie. 1989. Application of helical viscometry to study commercial Mozzarella cheese melting properties. *J. Dairy Sci.* 72:3123-3128.  
**Kindstedt, P.S.**, J.K. Rippe, and C.M. Duthie. 1989. Measurement of Mozzarella cheese melting properties by helical viscometry. *J. Dairy Sci.* 72:3117-3122.  
**Kindstedt, P.S.**, and J.K. Rippe. 1990. Rapid quantitative test for free oil (oiling-off) in melted Mozzarella cheese. *J. Dairy Sci.* 73:867-873.  
Pilcher, S. and **P.S. Kindstedt**. 1990. A survey of Mozzarella cheese quality at end use. *J. Dairy Sci.* 73:1644-1647.  
**Kindstedt, P.S.**, J.K. Rippe, and A.N. Pell. 1990. Protein distribution in high somatic cell milk during a study of long-term sometricbove, USAN treatment. *Cult.*

Dairy Prod. J. 25(4):12-16.

**Kindstedt, P.S.** 1991. Functional properties of Mozzarella cheese on pizza: A review. *Cult. Dairy Prod. J.* 26(3):27-31.

**Kindstedt, P.S.**, J.K. Rippe, A.N. Pell, D.S. Tsang, and G.F. Hartnell. 1991. Effect of long-term bovine somatotropin (somatotrope) treatment on nitrogen (protein) distribution in Jersey milk. *J. Dairy Sci.* 74:72-80.

Farkye, N.Y., L.J. Kiely, R.D. Allshouse, and **P.S. Kindstedt.** 1991. Proteolysis in Mozzarella cheese during refrigerated storage. *J. Dairy Sci.* 74:1433-1438.

**Kindstedt, P.S.**, and P.F. Fox. 1991. Modified Gerber test for free oil in Mozzarella cheese. *J. Food Sci.* 56:1115-1116.

Kiely, L.J., S.L. McConnell, and **P.S. Kindstedt.** 1991. Observations on the melting behaviour of imitation Mozzarella cheese. *J. Dairy Sci.* 74:3568-3572.

Lucey, J.A., **P.S. Kindstedt,** and P.F. Fox. 1991. Seasonality: its impact on the production of good quality Mozzarella cheese. *Ir. J. Ag. Food Res.* 30:41-48.

**Kindstedt, P.S.**, and L.J. Kiely. 1992. Revised protocol for the analysis of Mozzarella cheese melting properties by helical viscometry. *J. Dairy Sci.* 75:676-682.

Kiely, L.J., S.L. McConnell, and **P.S. Kindstedt.** 1992. Melting behavior of mozzarella/non-mozzarella cheese blends. *Cult. Dairy Prod. J.* 27(2):24-29.

**Kindstedt, P.S.**, L.J. Kiely, and J.A. Gilmore. 1992. Variation in composition and melting properties within brine-salted Mozzarella cheese. *J. Dairy Sci.* 75:2913-2921.

Kiely, L.J., **P.S. Kindstedt,** G.M. Hendricks, J.E. Levis, J.J. Yun, and D.M. Barbano. 1992. Effect of draw pH on the development of curd structure during the manufacture of Mozzarella cheese. *Food Structure* 11:217-224.

Kiely, L.J., **P.S. Kindstedt,** G.M. Hendricks, J.E. Levis, J.J. Yun, and D.M. Barbano. 1993. Age related changes in the microstructure of Mozzarella cheese. *Food Structure* 12:13-20.

Yun, J.J., D.M. Barbano, and **P.S. Kindstedt.** 1993. Mozzarella cheese - Impact of milling pH on chemical composition and proteolysis. *J. Dairy Sci.* 76:3629-3638.

Yun, J.J., D.M. Barbano, L.J. Kiely, and **P.S. Kindstedt.** 1993. Mozzarella cheese - Impact of milling pH on functional characteristics. *J. Dairy Sci.* 76:3639-3647.

Yun, J.J., D.M. Barbano, and **P.S. Kindstedt.** 1993. Mozzarella cheese - Impact of coagulant on chemical composition and proteolysis. *J. Dairy Sci.* 76:3648-3656.

Yun, J.J., L.J. Kiely, D.M. Barbano, and **P.S. Kindstedt.** 1993. Mozzarella cheese - Impact of coagulant on functional characteristics. *J. Dairy Sci.* 76:3657-3663.

Yun, J.J., L.J. Kiely, D.M. Barbano, and **P.S. Kindstedt.** 1993. Mozzarella cheese - Impact of cook temperature on chemical composition, proteolysis and functional characteristics. *J. Dairy Sci.* 76:3664-3673.

Barbano, D.M., J.J. Yun, and **P.S. Kindstedt.** 1994. Mozzarella cheese making by a stirred-curd no-brine procedure. *J. Dairy Sci.* 77:2687-2694.

Yun, J.J., Y.L. Hsieh, D.M. Barbano, and **P.S. Kindstedt.** 1994. Draw pH and

storage affect rheological properties of cheese. *J. Food Sci.* 59:1302-1304.

Yun, J.J., L.J. Kiely, D.M. Barbano, and **P.S. Kindstedt**. 1995. Mozzarella cheese - Impact of whey pH at draw on chemical composition, proteolysis and functional characteristics. *J. Dairy Sci.* 78:

J.H. White, B. Zavizion, K. O'Hare, J. Gilmore, M.R. Guo, and **P.S. Kindstedt**, and I. Politis. 1995. Distribution of plasminogen activator in different fractions of bovine milk. *J. Dairy Res.* 62:115-122.

Stelwagen, K., I. Politis, M.R. Guo, **P.S. Kindstedt**, S.R. Davis, and V.C. Farr. 1995. Mammary-derived growth inhibitor in bovine milk: Effect of milking frequency and somatotropin administration. *Can. J. Anim. Sci.* 75:695-698.

Yun, J.J., D.M. Barbano, L.J. Kiely, and **P.S. Kindstedt**. 1995. Mozzarella cheese - Impact of rod to coccus ratio on chemical composition, proteolysis and functional characteristics. *J. Dairy Sci.* 78:751-760.

Politis, I., J.H. White, B. Zavizion, J.J. Goldberg, M.R. Guo, and **P.S. Kindstedt**. 1995. Effect of individual caseins on plasminogen activation by bovine urokinase-type and tissue type plasminogen activators. *J. Dairy Sci.* 78:484-490.

Guo, M.R., P.F. Fox, A. Flynn, and **P.S. Kindstedt**. 1995. Susceptibility of  $\beta$ -lactoglobulin and sodium caseinate to proteolysis by pepsin and trypsin. *J. Dairy Sci.* 78:2336-2344.

Guo, M.R., and **P.S. Kindstedt**. 1995. Age-related changes in the water phase of Mozzarella cheese. *J. Dairy Sci.* 78:2099-2107.

**P.S. Kindstedt**, Yun, J.J., D.M. Barbano, and K.L. Larose. 1995 Mozzarella cheese - Impact of coagulant level on chemical composition, proteolysis and functional characteristics. *J. Dairy Sci.* 78:2591-2597.

Guo, M.R., G.M. Hendricks, **P.S. Kindstedt**, A. Flynn, and P.F. Fox. 1996. Nitrogen and mineral distribution in infant formulae. *Int. Dairy J.* 6:963-979.

**Kindstedt, P.S.**, K.L. Larose, and J.A. Gilmore. 1996. Distribution of salt and moisture in Mozzarella cheese with soft surface defect. *J. Dairy Sci.* 79:2278-2284.

Gou, M.R., P.F. Fox, A. Flynn, and **P.S. Kindstedt**. 1996. Heat-induced modifications of the functional properties of sodium caseinate. *Internat. Dairy J.* 6(5):473-483.

Renda, A., J.J. Yun, D. M. Barbano, **P.S. Kindstedt**, and S. Mulvaney. 1997. Influence of screw speed of the mixer at low temperature on characteristics of Mozzarella cheese *J. Dairy Sci.* 80:1901-1907

Guo, M.R., J.A. Gilmore, and **P.S. Kindstedt**. 1997. Effect of salt (NaCl) on the water phase of Mozzarella cheese. *J. Dairy Sci.* 80:3092-3098

Zhang, L., X. Zhou, L. Xiao, Y. Zhang, M.R. Guo, and **P.S. Kindstedt**. 1997. Studies on physicochemical properties of Human milk: gross composition and its change during lactation. *Acta Nutrimenta Sinica.* 19:357-361 (in Chinese)

Zhang, L., M.R. Guo, Y Zhang, and **P.S. Kindstedt**. 1997. Changes in the concentrations of protein and amino acids in Human milk during lactation. *J. Northeast Agric. Univ.* 27:378-385 (in Chinese)

Yun, J.J., D.M. Barbano, K.L. Larose, and **P.S. Kindstedt**. 1998. Mozzarella cheese - Impact of NDM Fortification on composition, proteolysis and functional properties. *J. Dairy Sci.* 81:1-8.

Wang, W., J.A. Gilmore, M.R. Guo, and **P.S. Kindstedt**. 1998. Changes in composition and meltability of Mozzarella cheese during contact with pizza sauce. *J. Dairy Sci.* 81:609-614

Guo, M.R., Z. Li, J. Qu, L. Jin, and **P.S. Kindstedt**. 1998. Ethanol stability of goat's milk. *Int. Dairy J.* 8:57-60.

Rudan, M.A., D.M. Barbano, and **P.S. Kindstedt**. 1998. Effect of fat particle size (homogenization) on low fat Mozzarella cheese chemical composition, proteolysis, functionality, and appearance. *J. Dairy Sci.* 2065-2076

Rudan, M.A., D.M. Barbano, and **P.S. Kindstedt**. 1998. Effect of fat type (Salatrim) on low fat Mozzarella cheese chemical composition, proteolysis, functionality, appearance, and yield. *J. Dairy Sci.* 2077-2088

Guo, M.R., G.M. Hendricks, and **P.S. Kindstedt**. 1998. Component distribution and interactions in powdered infant formula. *Internat. Dairy J.* 8:333-339.

Hong, Y-H., J.J. Yun, D.M. Barbano, and **P.S. Kindstedt**. 1998. Impact of three commercial *Lactobacillus* culture strains on Mozzarella cheese yield. *Aust. J. Dairy Technol.* 53:170-174

Hong, Y-H., J.J. Yun, D.M. Barbano, and **P.S. Kindstedt**. 1998. Mozzarella cheese: Impact of three commercial *Lactobacillus* culture strains on composition, proteolysis, and functional properties. *Aust. J. Dairy Technol.* 53:163-169

Rudan, M.A., D.M. Barbano, J.J. Yun, and **P.S. Kindstedt**. 1999. Mozzarella cheese: Effect of fat reduction on chemical composition, proteolysis, functionality, and Yield. *J. Dairy Sci.*82:661-672

Guo, M.R., G.M. Hendricks, and **P.S. Kindstedt** 1999. Effect of processing on protein-protein and protein-lipid interactions and mineral distribution in infant formula. *Internat. Dairy J.* 9:395-397

Metzger, L.E., D.M. Barbano, M.A. Rudan, **P.S. Kindstedt**, and M.R. Guo. 2000. Whiteness change during heating and cooling of Mozzarella cheese. *J. Dairy Sci.* 83:1-10.

Metzger, L.E., D.M. Barbano, M. A. Rudan, and **P.S. Kindstedt**. 2000. Effect of milk preacidification on low fat Mozzarella cheese: 1. Composition and yield. *J. Dairy Sci.* 83:648-658

**Kindstedt, P.S.** 2001. Moisture variation in brine salted pasta filata cheese. *J. AOAC Internat.* 84:605-610

Metzger, L.E., D.M. Barbano, **P.S. Kindstedt**, and M.R. Guo. 2001. Effect of milk preacidification on low fat Mozzarella cheese: 2. Chemical and functional properties during storage. *J. Dairy Sci.* 84:1348-1356

Metzger, L.E., D.M. Barbano, and **P.S. Kindstedt**. 2001. Effect of milk preacidification on low fat Mozzarella cheese: 3. Post-melt chewiness and whiteness. *J. Dairy Sci.* 84:1357-1366

Guo, M.R., P.H. Dixon, Y.W.Park, J.A. Gilmore and **P.S. Kindstedt**. 2001. Seasonal changes in the chemical composition of commingled goat milk. *J. Dairy Sci.* 84(E. Suppl.):1-5

Hendricks, G.M., M.R. Guo, and **P.S. Kindstedt**. 2001. Solubility and relative absorption of copper, iron, and zinc in two milk-based liquid infant formulae. *Internat. J. Food Sci Nutrit.* 52:419-428

**Kindstedt, P.S.**, A. Zielinski, M. Almena-Aliste and C. Ge. 2001. A post-



manufacture method to evaluate the effect of pH on mozzarella cheese characteristics. *Aust. J. Dairy Technol.* 56:202-207.

Ge, Q., M. Almena-Aliste and **P.S. Kindstedt**. 2002. Reversibility of pH-induced changes in the calcium distribution and melting characteristics of Mozzarella cheese. *Aust. J. Dairy Technol.* 57:3-9

Guo, M., Y.W. Park, P.H. Dixon, J.A. Gilmore and **P.S. Kindstedt**. 2004. Relationship between the yield of cheese (Chevre) and chemical composition of goat milk. *Small Ruminant Res.* 52:103-107

**Kindstedt, P.S.** 2004. Mozzarella cheese: 40 Years of Scientific Advancement. *Internat. J. Dairy Technol.* 57(2/3):85-90

**Kindstedt, P.S.** and L. Acosta. 2005. Effect of storage time and temperature on the serum phase of cultured cream cheese. *Aust. J. Dairy Technol.* 60:10-13

Almena Aliste, M. and **P.S. Kindstedt**. 2005. Effect of increasing pH on texture of full and reduced-fat Cream cheese. *Aust. J. Dairy Technol.* 60:225-230

Rajbhandari, P. and **P.S. Kindstedt**. 2005. Compositional factors associated with calcium lactate crystallization in smoked Cheddar cheese. *J. Dairy Sci.* 88:3737-3744

Rajbhandari, P. and **P.S. Kindstedt**. 2005. Development and Application of Image Analysis to Quantify Calcium Lactate Crystals on the Surface of Smoked Cheddar Cheese. *J. Dairy Sci.* 88:4157-4164

Almena-aliste, M., M.L. Gigante and **P.S. Kindstedt**. 2006. Impact of pH on the texture of cultured Cream cheese: firmness and water phase characteristics. *Milchwissenschaft Milk Sci. Internat.* 61:400-404

Gigante, M.L., M. Almena-Aliste and **P.S. Kindstedt**. 2006. Effect of cheese pH and temperature on serum phase characteristics of Cream cheese during storage. *J. Food Sci.* 71:C7-11

Rajbhandari, P. and **P.S. Kindstedt**. 2008. Characterization of calcium lactate crystals on Cheddar cheese by image analysis. *J. Dairy Sci.* 91:2190-2195

Cortez, M.A.S., M.M. Furtado, M.L. Gigante and **P.S. Kindstedt**. 2008. Effect of pH on characteristics of low moisture Mozzarella cheese during refrigerated storage. *J. Food Sci* 73:S443-448

Monteiro, R.R., D.Q. Taveres, **P.S. Kindstedt** and M.L. Gigante. 2009. Effect of pH on microstructure and characteristics of Cream cheese. *J. Food Sci* 74:C112-117

Rajbhandari, P., J. Patel, E. Valentine and **P.S. Kindstedt**. 2009. Chemical changes that predispose smoked cheddar cheese to calcium lactate crystallization. *J. Dairy Sci.* 92:3616-3622

Rajbhandari, P., J. Patel, E. Valentine and **P.S. Kindstedt**. 2013. Effect of storage temperature on crystal formation rate and growth rate of calcium lactate crystals on smoked cheddar cheese. *J. Dairy Sci.* 96:3442-3448

**Kindstedt, P.S.** 2013. The Making of Great Cheeses. *Microbe* 8(9):361-7

**Kindstedt, P.S.** 2013. Making Great Cheeses, Part 2. *Microbe* 8(10):401-7

Rajbhandari, P. and **P.S. Kindstedt**. 2014. Surface roughness and packaging tightness affect calcium lactate crystallization on Cheddar cheese. *J. Dairy Sci.* 97:1885-1892.

Tansman, G., **P.S. Kindstedt** and J.M. Hughes. 2014. Powder X-ray diffraction can differentiate between enantiomeric variants of calcium lactate pentahydrate. *J. Dairy Sci.* 97:1885-1892.

Tansman, G., **P.S. Kindstedt** and J.M. Hughes. 2015. Crystal fingerprinting: Elucidating the crystals of Cheddar, Parmigiano-Reggiano, Gouda and soft washed-rind cheeses using powder X-ray diffractometry. *Dairy Sci. Technol.* 95(5):651-664. DOI 10.1007/s13594-015-0225-6

Tansman, G., P.S. Kindstedt and J.M. Hughes. 2017. Minerals in food: Crystal structures of ikaite and struvite from bacterial smears on washed-rind cheese. *The Canadian Mineralogist* 55:89-100.

**Kindstedt, P.S.** 2017. With all your mind. *God and Nature*. Winter/Spring 17 (<http://godandnature.asa3.org/essay-with-all-your-mind-by-paul-s-kindsedt.html>)

Tansman, G., P.S. Kindstedt and J.M. Hughes. 2017. Crystallization and demineralization phenomena in stabilized paste white mold cheese. *J. Dairy Sci.* 100:6074-6083.

Tansman, G., P.S. Kindstedt and J.M. Hughes. 2017. Crystallization and demineralization phenomena in washed rind cheese. *J. Dairy Sci.* 100:8694-8704.

Kindstedt, P.S. 2018. Heart and Mind. *Perspectives on Science and Christian Faith* 70(2):144.

Polowsky, P.J., G.F. Tansman, P.S. Kindstedt and J.M. Hughes. 2018. Characterization and identification of surface crystals on smear ripened cheese by polarized light microscopy. *J. Dairy Sci.* 101:7714-7723.

Polowsky, P.J., P.S. Kindstedt and J.M. Hughes. 2018. Size, Shape, and Identity of Surface Crystals and their Relationship to Sensory Perception of Grittiness in Soft Smear-ripened Cheeses. *J. Dairy Sci.* 101:10720-10732. Kindstedt, P.S.

2018. Creating a Third Culture. *God and Nature*. Fall 18 (<https://godandnature.asa3.org/kindstedt.html>)

Publicover, H. and P.S. Kindstedt. 2018. Eating Curds Their Way? Early rabbinic rulings on Jewish cheesemaking and the cheese of non-Jews. *Food Studies: An Interdisciplinary Journal* 8(4):17-27.

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#### Nonrefereed Journal

- Kindstedt, P.S.** 1984. Marketing cheese at the point of sale gets a boost. *Dairy Deli Mgt.* 13(2):1
- Kindstedt, P.S.** 1986. Old world cheesemaking in Vermont. *Vermont Science* 11(1):1.
- Kindstedt, P.S.** 1987. The European Mold. *North by Northeast* 2(6):8-9
- Kindstedt, P.S.** 1989. Cheesemakers' course a success. *Vermont Science* 13(1):4
- Kindstedt, P.S.** 1996. Fat replacement in natural cheese. *Opta facts* 8(4):2-3.
- Kindstedt, P.S.** 1998. Directly-acidified Mozzarella sparks interest. *Cheese Market News* 18(10):8
- Kindstedt, P.S.** 1999. Elimination of aging in mozzarella cheese through direct acidification. *Engenharia de Alimentos (in Portuguese)*
- Kindstedt, P.S.** 1999. Raw milk cheesemaking. The future hangs in the balance. *Vermont Cheese Council* 1(3):2
- Kindstedt, P.S.** 2001. Resolving the raw milk cheese issue. *Cheese Market*

News, January 19, P.4

**Kindstedt, P.S.** 2004. Views on Raw Milk Cheeses: Part 1. Why Raw Milk Cheeses are Worth Saving. Cheese Reporter, August 27, 2004. pp. 4, 10

**Kindstedt, P.S.** 2004. Views on Raw Milk Cheeses: Part 2. Pasteurization Isn't the Best Approach to Enhance Cheese Safety. Cheese Reporter, September 3, 2004. p. 4

**Kindstedt, P.S.** 2008. Four challenges facing the cheese industry. Amer. Cheese Soc. Newsletter, 1<sup>st</sup> quarter, p.12-13

**Kindstedt, P.S.** 2010. Lessons learned on the safety of raw products. Cheese Reporter, August 20, 2010, pp. 4,19

### Professional Presentations

**Kindstedt, P.S.** 1983. Sodium and salt in cheese, and methods of analysis. 1<sup>st</sup> Ann. Mtg. Amer. Cheese Soc., Cornell Univ., Ithaca, NY

**Kindstedt, P.S.** 1984. Quality control in commercial cheesemaking. 2<sup>nd</sup> Ann. Mtg. Amer. Cheese Soc., Rutgers Univ., New Brunswick, NJ

**Kindstedt, P.S.** 1986. A dairy products center at Burlington, Vermont - A unique resource for small dairy companies. 4<sup>th</sup> Ann. Mtg. Amer. Cheese Soc., Rome, NY

**Kindstedt, P.S.** 1986. New dairy product development. Ann. Mtg. Vt. Dairy Ind. Assoc., Burlington, VT

**Kindstedt, P.S.** 1986. Specialty cheeses: A profitable use for Vermont milk? Newport Rotary Club Farmer's Day 1986, Newport, VT

**Kindstedt, P.S.** 1986. Old world cheeses. Across The Fence, broadcast September 3<sup>rd</sup>, Burlington.

**Kindstedt, P.S.** 1988. Summer short course for cheesemakers University of Vermont, Burlington.

**Kindstedt, P.S.** 1989. The art and science of cheesemaking. American Chemical Society seminar series. Russell Sage College, Troy, NY.

**Kindstedt, P.S.** 1989. Cheesemakers seminar on starter cultures and coagulants. University of Vermont, Burlington.

**Kindstedt, P.S.** 1990. Cheesemakers have problems too. Annual Mtg. Vermont Region Eastern Breeders Cooperative, East Burke, VT.

**Kindstedt, P.S.** 1992. A comprehensive look at the aging process of Mozzarella cheese. Pillsbury Distinguished Speaker Seminar Series, Cornell University, Ithaca, NY. February 4.

**Kindstedt, P.S.** 1992. Proteolytic, microstructural, textural, and functional changes during aging of low moisture Mozzarella cheese. Seminar at Svenska Mejeriernas Riksforening Research Station, Falkenberg, Sweden.

**Kindstedt, P.S.** 1992. Developments in the Vermont Dairy Industry: the news isn't all bad. Chittenden County Grange

Meeting, June 16.

**Kindstedt, P.S.** 1993. Mozzarella Cheese Research at NEDFRC. Cornell Conf. Dairy Market Prod. Res., Syracuse, NY.

Kiely, L.J., **P.S. Kindstedt**, G.M. Hendricks, J.E. Levis, J.J Yun, and D.M. Barbano. 1993. Age related changes in the microstructure of Mozzarella cheese. Food Structure 1993 Program, Chicago, May 9.

**Kindstedt, P.S.** 1993. Short course on the manufacture of Mozzarella cheese. Conducted for the Annu. Mtg. Amer. Cheese Soc., Shelburne, VT, August 11.

**Kindstedt, P.S.** 1993. Origins of cheese flavor. Annu. Mtg. Amer. Cheese Soc., Shelburne, VT, August 12.

**Kindstedt, P.S.** 1999. Rind and Reason: A look at the chemistry behind the Brie rind. Amer. Cheese Soc. Annual Mtg., August 12, Shelburne, VT

**Kindstedt, P.S.** 1999. Is there a future for raw milk cheese. 16<sup>th</sup> Amer. Cheese Soc. Annual Conf., August 12, Shelburne, VT

**Kindstedt, P.S.** 1999. The changing landscape of Vermont cheese. Stowe Rotary Club, Stowe, VT.

**Kindstedt, P.S.** 2000. What controls the melting characteristics of Mozzarella cheese and why should we care? Cornell University Dept. of Food Science Distinguished Speaker Seminar Series, Ithaca, NY, April 11.

**Kindstedt, P.S.** 2000. Scientific status of the raw milk cheese safety issue. 17<sup>th</sup> Amer. Cheese Soc. Annual Conf., August 10, Sonoma, CA.

**Kindstedt, P.S.** 2000. Why would anyone study cheese. Vermont Dairy Industry Association Annual Fall Conference, Burlington, VT, Sept. 13<sup>th</sup>

**Kindstedt, P.S.** 2001. Effect of cheese pH on the melting characteristics of Mozzarella cheese. 14<sup>th</sup> Annu. Cornell Conf. on Dairy Markets and Product Res., Syracuse, NY. March 4<sup>th</sup>

**Kindstedt, P.S.** and T.J Pritchard. 2002. Safety of raw milk cheeses. FDA Northeast Region Milk Seminar, Burlington, VT June 12<sup>th</sup>

**Kindstedt, P.S.** 2002. The future of adding value and diversity. Milk – From Commodity to Cheese. Cheesemaking in the future of Vermont Agriculture. Conference held at Shelburne Farms, sponsored by the Northeast Center for Food Entrepreneurship, November 16<sup>th</sup>

**Kindstedt, P.S.** 2003. Impact of pH and changes in the serum phase on syneresis and texture in Cream cheese. 16<sup>th</sup> Annual Cornell Conference on Dairy Markets and Product Research, Syracuse, NY, March 3<sup>rd</sup>

**Kindstedt, P.S.** 2003. Formulating Cream cheese to meet market opportunities. International Dairy Foods Association 2003 Cultured Dairy Products Conference, Milwaukee, WI. May 22<sup>nd</sup>

**Kindstedt, P.S., and P. Rajbhandari.** 2005. Factors that influence the onset and rate of calcium lactate crystallization in naturally-smoked Cheddar cheese. 18<sup>th</sup> Annual Cornell Conference on Dairy Markets and Product Research, Syracuse, NY. March 7<sup>th</sup>

**Kindstedt, P.S.** 2005. Sensory and nutritional aspects of cheese produced from pasteur-fed animals. Kellogg Foundation Conference on Food and Society, Washington, DC. April 28<sup>th</sup>

**Kindstedt, P.S.** 2005. Calcium lactate crystals in cheese and whey. American Dairy Products Institute Annual Conference, Chicago, May 3<sup>rd</sup>

**Kindstedt, P.S.** 2005. Milk Quality: Great cheese starts with great milk. American Cheese Society 22<sup>nd</sup> Annual Meeting, Louisville, KY, July 21<sup>st</sup>

**Kindstedt, P.S.** 2005. All about flavor: Aged raw milk cheese production. American Cheese Society 22<sup>nd</sup> Annual Meeting, Louisville, KY, July 21<sup>st</sup>

**Kindstedt, P.S.** 2006. Bringing Quality to the Consumer. Great Milk, Great Markets Conference, La Cross, WI, September 11<sup>th</sup>

**Kindstedt, P.S.** 2007. Reviving Artisan Cheesemaking: A Global View. Keynote Opening Address, Ontario Cheese Society 2007 Annual Meeting, Toronto, March 23<sup>rd</sup>

**Kindstedt, P.S.** 2007. A Cultural History of Artisan Cheesemaking in America. Keynote Address to the Culinary Historians of New York, May 9

**Kindstedt, P.S.** 2007. The Science of Cheese. Keynote address, New York Academy of Sciences, May 10<sup>th</sup>

**Kindstedt, P.S.** 2007. American Artisan Cheese: Is the sun setting or rising? Keynote address, American Cheese Society, 2007 Annual Meeting, Burlington, VT, August 2<sup>nd</sup>

**Kindstedt, P.S.** 2008. Can calcium lactate crystals be controlled in Cheddar cheese without changing the manufacturing process? 20<sup>th</sup> Annu. Cornell Conf. On dairy Markets and product research, Syracuse, NY, March 3<sup>rd</sup>

**Kindstedt, P.S.** 2008. The Chemistry of Cheese. American Chemical Society, 35<sup>th</sup> Northeast Regional Mtg., Burlington, VT, July 2<sup>nd</sup>

**Kindstedt, P.S.** 2008. Demystifying rennets and coagulants. American Cheese Society, 2008 Annual Meeting, Chicago, July 24<sup>th</sup>

**Kindstedt, P.S.** 2010. A local approach to safe dairy products. VT Dairy Industry Assoc. Annual Meeting, S. Burlington, Sept. 22.

**Kindstedt, P.S.** 2010. History of cross-pollination between the UK and NEK. 1<sup>st</sup> Biennial Jasper Hill-Neal's Yard Dairy Symposium, Greensboro, VT, October 19.

**Kindstedt, P.S.** 2011. Mechanisms of Coagulation. The principles, the science and what they mean to cheesemakers. 28<sup>th</sup> Annual Meeting, American Cheese Society, Montreal, Que, August 5<sup>th</sup>

**Kindstedt, P.S.** 2011. What Food Systems Research Does *Not* Look Like. The growing urgency for transdisciplinary research. Vermont Dairy Industry Association Annual Meeting, Burlington, September 21<sup>st</sup>

**Kindstedt, P.S.** 2012. Cheese and Culture: Lessons from the past; thoughts for the future. 29<sup>th</sup> Annual Meeting, American Cheese Society, Raleigh, NC, August 2<sup>nd</sup>

**Kindstedt, P.S.** 2013. ACS' Rock of Ages: Unplugged, Uncensored, and Uncut! 30<sup>th</sup> Annual Meeting, American Cheese Society, Madison WI, August 3<sup>rd</sup>

**Kindstedt, P.S.** 2014. Cheese and Sustainability. Shelburne Farms, Shelburne, VT. June 12<sup>th</sup>

**Kindstedt, P.S.** 2014. Crystal fingerprinting: Elucidating the crystalline identities of Cheddar, Parmigiano-Reggiano, Gouda and soft washed rind cheeses using powder X-ray diffractometry. Ninth Cheese Symposium, Cork Ireland, November 12.

Tansman, G. **P.S. Kindstedt** and J.M. Hughes. 2016. Crystals in bloomy rind and washed rind cheeses: Impact on surface grittiness. The Science of Artisan Cheese, London, August 24.

**Kindstedt, P.S.** 2016. Survival, Prosperity and Meaning: Glimpses into 10,000 years of Cheese and Humanity. Barnyard Collective, Long Island City, NY. September 12.

**Kindstedt, P.S.** and P.J. Polowsky. 2017. Demystifying the complex world of cheese crystals. 2017 Annual Conference of the American Cheese Society, Denver, CO., July 28. Marcellino, N. and P.S. Kindstedt. 2017. Molds, monasteries and microscopes. Slow Food USA event, Crown finish Caves, Brooklyn, NY, May 21.

**Kindstedt, P.S.** 2018. Are you ready to fall in love? (with cheese crystals of course). Jasper Hill Science Fair, Highland Center for the Arts, Greensboro, VT, August 11.

Kindstedt, P.S. 2020. A Zoom-ed out History of Hard Cheese. Jasper Hill Science Webinar, Greensboro, VT, October 22.

**Kindstedt, P.S.** 2022. The Napa Valley of Cheese. What Makes Vermont Cheese so Special? Vermont Cheese Council Cheese Summit, Shelburne, VT, August 14/

<b>CONTRACTS, GRANTS AND GIFTS</b>
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- Effect of mineral content on yield and functional properties of Mozzarella cheese. 1987-1988. Dairy Research Foundation. **P.S. Kindstedt**, PI. (\$57,188)
- Effect of mastitis and mineral content on yield and functional properties of Mozzarella cheese. 1987-1992. Vermont AES Hatch Grant. **P.S. Kindstedt**, PI. (\$145,000.)
- General research on mastitis and bovine somatotropin. 1987. Walker Research Fund. **P.S. Kindstedt**, PI. (\$7,000.)
- Ultrafiltration equipment grant. 1986. Vermont Dairy Industry Council. **P.S. Kindstedt**, PI. (\$15,000.)
- Effect of bovine somatotropin treatment on Kjeldahl nitrogen distribution in Jersey milk. 1986-1987. Monsanto Agricultural Company. **P.S. Kindstedt**, PI. (\$4,924.)
- Development of methods to objectively measure melted mozzarella cheese functionality. 1988-1989. National Dairy Promotion and Research Board. **P.S. Kindstedt**, PI. (\$28,422.)
- Effect of milkfat globule size on fat recovery in Cheddar cheese made from Jersey and Holstein milk. 1987 - 1988 American Jersey Cattle Club. **P.S. Kindstedt**, PI. (\$3,143.)
- Effect of subclinical mastitis by a minor pathogen on milk proteins, protease activity, and casein degradation in Jersey milk. 1987 -1988. American Jersey Cattle Club. **P.S. Kindstedt**, PI. (\$3,176.)
- Effect of curd mineral content on initial Mozzarella cheese functionality and time-related functional changes. 1989-1990. National Dairy Promotion and Research Board. **P.S. Kindstedt**, PI. (\$35,325.)
- Cheese Manufacturing parameters that protein breakdown and functional characteristics of Mozzarella cheese. 1989-1992. Northeast Dairy Foods Research Center. D.M. Barbano, PI. (Cornell University) **P.S. Kindstedt**, Co-investigator. (\$204,439.)
- Utilization of composition gradients in Mozzarella cheese for studying cheese functionality. 1989-1990. Northeast Dairy Foods Research Center. **P.S. Kindstedt**, PI. (\$33,379.)
- Seasonal changes in milk chemistry and their effect on mozzarella cheese functionality. 1990. USDA U.S.-Ireland Cooperation in Agricultural Science and Technology Programme. C.W. Donnelly, PI, **P.S. Kindstedt**, Co-investigator, P.F. Fox, Cooperating Scientist (University College Cork, Ireland) (\$5,877.)
- Advancement of nutritive-economic value of products by usage of membrane processes and other modern methods in dairy technology. 1991-1993. USDA Special Foreign Currency Research Program. M. Caric, PI., (Faculty of Technology, Novi Sad, Yugoslavia) **P.S. Kindstedt**, Cooperating Scientist (project terminated by USDA due to unstable political conditions) (\$32,600.)

- Request for a high performance liquid chromatograph for food and nutritional science research. 1990. Univ. of Vermont Research Advisory Council . S.J. Pintauro, PI., A.N. Pell, **P.S. Kindstedt**, and L.B. Carew, Co-investigators (\$12,739.)
- A new cheese manufacturing method for improvement of Mozzarella cheese quality. 1991. Northeast Dairy Foods Research Center, D.M. Barbano, PI, **P.S. Kindstedt**, Co-investigator (\$77,715.)
- Mathematical modeling of Mozzarella cheese aging phenomena to facilitate improved control over cheese quality during storage and distribution. 1991. Northeast Dairy Foods Research Center, **P.S. Kindstedt**, PI, H. Chen Co-investigator (\$15,236.)
- Production, in Vermont, of high moisture, fresh Mozzarella cheese. 1991. Northeast Dairy Foods Research Center, **P.S. Kindstedt**, PI. (\$22,949.)
- China-U.S. scientific exchange visit (2 weeks), 1991. Northeast Agricultural College, Harbin, P.R. China Matching grant from Ministry of Agriculture, P.R. China (\$2,000.)
- Improved control over Mozzarella cheese quality -Phase 2. 1992-1993. Northeast Dairy Foods Research Center, D.M. Barbano, PI, **P.S. Kindstedt**, Co-Investigator \$308,438.
- Development of technology for low fat Mozzarella cheese manufacture. 1992-1993. Northeast Dairy Foods Research Center. D.M. Barbano, PI, **P.S. Kindstedt**, Co-investigator \$168,027.
- Process analysis as the basis for optimization of the texturization of Mozzarella cheese. 1992-1993. Northeast Dairy Foods Research Center. S.J. Mulvaney, PI, D.M. \$180,000.
- Barbano and **P.S. Kindstedt**, Co-investigators. Effect of manufacturing and processing conditions on the functional properties of Mozzarella cheese. 1992-1995. \$127,724.
- Vermont AES Hatch Grant. **P.S. Kindstedt**, PI. Improvement in infant formula development and functionality: Implications for increased milk utilization - Phase I. 1993-1994. Northeast Dairy Foods Research Center. **P.S. Kindstedt**, PI. \$38,875.
- Characterization of the water phase of Mozzarella cheese and its relationship to functional properties. 1994-1995. Northeast Dairy Foods Research Center. **P.S. Kindstedt**, PI, D.M. Barbano, Co-investigator. \$ 44,240.
- Development of technology for manufacture of low fat Mozzarella cheese - Phase 2. 1995-1997. Northeast Dairy Foods Research Center. D.M. Barbano, PI, **P.S. Kindstedt**, Co-investigator. \$167,414.
- Transfer of no-brine Mozzarella cheese technology to the northeast Mozzarella cheese industry. 1994-1996. Northeast Dairy Foods Research Center. D. M. Barbano, PI, **P.S. Kindstedt**, Co-investigator \$73,817.
- Characterization and control of compositional and functional changes in Mozzarella cheese used as an ingredient for refrigerated pizza. 1995-1997. Northeast Dairy Foods Research Center. **P.S. Kindstedt**, PI. \$40,840.
- Equipment grant: Conveyor pizza oven. 1995. Blodgett Co., Burlington, VT. (valued at \$25,000.)



- Acquisition of an inductively coupled plasma atomic emission spectrometer. 1996. USDA National Reseach Initiative Competitive Grants Program. D. Ross, PI, **P.S. Kindstedt**, T. Scherbatskoy, W.E. Jokela, D.H. Dehayes, J.J. Hughs, W.S. Harper, and J. Hoffman, Co-investigators. \$49,975.
- Characterization and control of compositional and functional changes in Mozzarella cheese used as an ingredient for refrigerated pizza. 1996-1997. Vermont AES Competitive Hatch Grant. **P.S. Kindstedt**, PI. \$33,435.
- Improved shelf-life and quality of direct-set Cream cheese through enhanced control of the water phase. 1996-1998. Northeast Dairy Foods Research Center. **P.S. Kindstedt**, PI. \$91,338.
- Mozzarella cheese research. 1995. Fresco Foods, Inc., Chelsea, MA. **P.S. Kindstedt**, PI \$2000.
- Goat's milk research. 1996-1997. Vermont Butter and Cheese Co., Websterville, VT. **P.S. Kindstedt**, PI \$7,000.
- Research on Cream cheese products. 1996. Vermont Dairy Promotion Council. **P.S. Kindstedt**, PI \$25,000.
- Reducing the post baking chewiness of lowfat Mozzarella cheese on pizza. 1998-2000. Northeast Dairy Foods Research Center. D.M. Barbano, PI, **P.S. Kindstedt**, Co-investigator. \$163,128.
- Application of new nonfat Cream cheese base for the development of reduced-fat and nonfat Cream cheese. 1997. Vermont Dairy Promotion Council. **P.S. Kindstedt**, PI. \$25,000.
- Research on natural whey-sweetened and calcium-fortified fruit juice beverages. 1997. Vermont Dairy Promotion Council. **P.S. Kindstedt**, PI. \$25,000.
- Chemical, physico-chemical and microstructural factors that affect the functionality of Cream cheese. 1997-2000. Vermont AES Competitive Hatch Grant. **P.S. Kindstedt**, PI. \$56,378.
- Development of yogurt cheese prototypes. 1998. New England Dairy Promotion Board. **P.S. Kindstedt**, PI, C.W. Donnelly, Co-investigator \$40,000.
- Enhancing the development of a farmstead cheese industry in Vermont through outreach and technology transfer. 1998-1999. Vermont Dairy Promotion Council. **P.S. Kindstedt**, PI, C.W. Donnelly, Co-investigator \$83,000
- Enhancement of cream cheese research program. 1998. New England Dairy Promotion Board. **P.S. Kindstedt**, PI \$30,000.
- NEDFRC Dairy Products Coordinator. 2000. New England Dairy Promotion Board/Vermont Dairy Promotion Council. **P.S. Kindstedt**, A.J. Bramley, Co-investigators \$30,000.
- Modifying European cheesemaking to create small farm Economic opportunities. 2000. Small Business Innovation Research/USDA. Allison Hooper, PI, **P.S. Kindstedt**, Co-investigator \$69,680
- Request for a gas chromatograph to underpin studies on lipid metabolism and enhanced fat composition. 2000. T.B. McFadden, PI, L. Carew, H. Chen, **P.S. Kindstedt**, J. Knapp and N Sheard, Co-Investigators. UVM-Research

- Advisory Council \$15,000.
- A novel model system to study the independent effect pH on cheese properties. 2000-2003. Vermont AES Competitive Hatch Grant, **P.S. Kindstedt**, PI \$54,850
  - A novel model system to study reversible pH-induced changes in the melting and shredding characteristics of Mozzarella cheese. 2001. Northeast Dairy Foods Research Center, **P.S. Kindstedt**, PI \$32,216.
  - Enhancing safety and expanding markets for farmstead Cheese produced in the US and Ireland through focus on microbiological and chemical parameters. 2001-2003 USDA U.S.-Ireland Cooperation in Agricultural Science and Technology Programme. C.W. Donnelly, PI, **P.S. Kindstedt**, Co-investigator, C. Hill, Cooperating Scientist(University College Cork, Ireland) \$45,000.
  - Preliminary evaluation of the effect of soluble calcium on the formation of calcium lactate crystals in Cheddar cheese. 2003. Northeast Dairy Foods Research Center, P.S. Kindstedt, PI (\$44,150)
  - Simple analytical method to quantify calcium lactate crystals on Cheddar cheese. 2003-2006. Vermont AES Competitive Hatch Grant, P.S. Kindstedt, PI (\$28,900)
  - Expanding non-traditional dairying in Vermont: Understanding seasonal variation in water buffalo milk composition and controlling its effect on cheese quality. 2004. USDA-SBIR Phase I, D.F. Muller, PI, **P.S. Kindstedt**, Co-investigator (\$76,154)
  - Training Center for On-Farm Milk Processing. 2004. USDA-SARE grant, Peter Dixon, PI, P.S. Kindstedt, Co-investigator (\$10,000)
  - SHD Sensory Evaluation for Star Hill Dairy. 2004. Research contract with Star Hill Dairy, Inc., P.S. Kindstedt, PI. (\$13,583)
  - Application of image analysis to determine the causes of calcium lactate crystals on Cheddar cheese. 2006-2008. Northeast Dairy Foods Research Center, **P.S. Kindstedt**, PI (\$72,000)
  - Imaging methods to characterize calcium lactate crystallization in Cheddar cheese. 2007-2010. Vermont AES Competitive Hatch Grant, P.S. Kindstedt, PI (\$39,000)
  - Enhancing the profitability and sustainability of small and medium sized dairy farms through artisan cheese and other value-added products. 2010-2012. CSREES-USDA, Q. Wang, PI., R. Parsons, **P.S. Kindstedt** and C.W. Donnelly, Co-PI's, (\$230,000.)
  - Enhancing the quality of artisan cheese in Vermont. 2011. Vermont AES Research Incentive Hatch Grant, **P.S. Kindstedt**, PI. (\$10,000)
  - Understanding cheese crystals as a means to differentiate and add value to artisan cheeses. 2013-2014. Vermont AES Competitive Hatch Grant, P.S. Kindstedt, PI (\$24,590)
  - Characterization of crystals that enhance the value of artisanal cheeses. 2014-2017. Vermont AES Competitive Hatch Grant, **P.S. Kindstedt**, PI (\$32,790)
  - Evaluation of crystals and their relationship to grittiness in soft washed rind

cheeses: Survey of the U.S. marketplace. 2018-2019. Vermont AES  
Competitive Hatch Grant, **P.S. Kindstedt**, PI (\$21,102)