

MANUEL CASTILLO, PH.D.

Department of Biosystems and Agricultural Engineering
University of Kentucky – 201 Barnhart Building
Lexington, Kentucky 40546-0276 -- USA
Home Page: www.bae.uky.edu/mcastill

Office: (859) 257-3000, ext. 201
Home: (859) 272-1686
Fax: (859) 257-5671
E-mail: mcastill@bae.uky.edu

CURRICULUM VITAE

1. PROFESSIONAL SUMMARY

Food scientist with strong background in food chemistry and physics, kinetics of chemical reactions in food, automation control in food processing, optical sensor technology, NIR spectrometry, microstructure of food products, dynamic low amplitude rheology, and basic operations/ chemical engineering in food processing.

Veterinary scientist with strong knowledge in animal science, public health, and veterinary medicine.

Design and conduct research projects. Awarded approximately US-\$1.5 million in U.S., Irish and Spanish research grants since November 2003. Write research proposals and scientific publications.

Plan and conduct quality presentations. Computer proficiency includes SAS, SPSS, Excel, Word, PowerPoint, Outlook, FrontPage, and Visual Basic.

Bilingual. Native language Spanish, fluent in spoken and written English. Extensive global experience.

2. EDUCATION

Ph.D. in Food Science and Technology, University of Murcia. Spain, 2002. *Summa cum laude.*

Areas of Knowledge: Dairy chemistry and physics, milk coagulation monitoring, clotting and cutting time prediction, and modeling kinetics of aggregation and curd firming processes.

Dissertation: Cutting time prediction in cheese making by near infrared light backscatter. University of Murcia, Spain. January 25, 2002. **Directors:** F.A. Payne. University of Kentucky; J. Laencina and M.B. López. University of Murcia.

B.S. in Food Science and Technology, University of Murcia. Spain. September 1999.

Recipient, Summa Cum Laude Prize (Premio Extraordinario Fin de Carrera), given annually to the University's outstanding Food Science graduate.

Areas of Knowledge: Food chemistry and biochemistry, chemical and instrumental analysis, food engineering, basic operations, chemical engineering, food hygiene and microbiology, food toxicology, dietetics and human nutrition.

B.S. in Veterinary Science, US Equivalent to Doctor in Veterinary Medicine, University of Murcia. Spain. June 1995.

Areas of Knowledge: Animal science, including anatomy, physiology, microbiology, immunology, genetics, nutrition, pathology, feeding, animal production, veterinary clinic, and public health. Complementary knowledge in plant production and agriculture.

3. ANECA and AQU ACREDITATION (SPAIN)

Professional categories: “Profesor Contratado Doctor” and “Profesor Agregado” (Titular), equivalent to Associate Professor; “Profesor Ayudante Doctor” (Ayudante), equivalent to Assistant Professor; “Profesor Colaborador”, equivalent to Lecturer.

4. PROFESSIONAL EXPERIENCE

University-Based Research & Teaching

ASSISTANT RESEARCH PROFESSOR
INSTRUCTOR

2004-Present
2005 and 2007

University of Kentucky, Dept. of Biosystems & Agricultural Engineering, Lexington, Kentucky, USA. Currently investigating optical methods to monitor the syneresis process in cheese making and the meat emulsification process for finely comminuted meat products. Also team taught courses in Food and Bioprocess Engineering (BAE 549) and Introduction to Food Processing (FSC 306) in the Departments of Biosystems and

4. PROFESSIONAL EXPERIENCE - *continued*

Agricultural Engineering and Animal and Food Sciences, respectively. Lectures posted at:

<http://www.bae.uky.edu/mcastill/>

- **Co-directed two Ph.D. programs:** Eduardo Ferrandini Banchemo, University of Murcia, 2006 (*Dissertation topic: “Elaboración de Queso de Murcia al Vino con cuajo natural en pasta”*); Colette Fagan, University College Dublin 2007 (*Dissertation topic: “On-line monitoring in processed and natural cheese manufacture”*).
- **Currently Directing a Postdoctoral student.** Daniel Álvarez Álvarez. University of Kentucky. (*Research topic: “Applying optical sensor technologies for determining meat emulsion stability”*).
- **Currently Co-directing two Postdoctoral students.** Colette Fagan, University College Dublin, Ireland and Colm Everard, Teagasc, Moorepark, Cork, Ireland (*Research topic: “Development of a syneresis sensor technology to control syneresis in cheese making”*).
- **Currently Co-directing one Ph.D. and two M.S. programs:** María José Mateo Riquelme, University College Dublin (*Dissertation topic currently under discussion*); Clara Talens Vila, University College Dublin (*Thesis topic currently under discussion*); Alisa Lamb, University of Kentucky (*Thesis topic: “Optical detection of whey proteins denaturation in milk”*).

SCIENTIFIC CONSULTANT**2005-2009**

University College Dublin, Dept. of Biosystems Engineering, Republic of Ireland

Teagasc, The Irish Agriculture & Food Development Authority, Cork, Republic of Ireland

University of Murcia, Spain

Currently assisting Irish academic and government research partners in collaborative work for the development of a syneresis control sensor technology. Assisting Spanish partners in collaborative work for the development of a meat emulsion stability control sensor technology and for adaptation of a syneresis control sensor technology to goat milk cheese manufacture.

POSTDOCTORAL RESEARCH ASSISTANT**2003-2004****INSTRUCTOR****2003**

University of Kentucky, Dept. of Biosystems & Agricultural Engineering, Lexington, Kentucky, USA

Investigation of optical methods to monitor syneresis process in cheese making. Also team taught FSC 306 (referenced above). Lectures posted at: <http://www.bae.uky.edu/mcastill/>

POSTDOCTORAL RESEARCH ASSISTANT**2002-2003**

University of Wisconsin at Madison, Dept. of Food Science, Madison, Wisconsin, USA

Study of physical and rheological properties in cottage cheese gels, including syneresis kinetic, shrinkage of curd grains, curd permeability and microstructure of curd.

POSTDOCTORAL RESEARCH ASSISTANT**2002****GRADUATE RESEARCH ASSISTANT****1995-2002****INSTRUCTOR****1994-2002**

University of Murcia, Food Science, Human Nutrition & Food Safety, Murcia, Spain

Prediction of cutting time during cheese making. Development of a fiber optic sensor to measure low-fat concentration in whey. Taught courses including: Food Science (7W1) and Canned Food, Fruits and Vegetables/ Fruit Juices (7W2) in the Food Science curriculum; also taught Food Technology (VETS 195) in the Veterinary Science curriculum. As a postdoctoral researcher, also taught an Advanced Food Science lab in the PhD program.

Industrial Experience**REGIONAL MANAGER for FOOD SAFETY INSPECTION****1995-1998**

Laboratory for Analysis and Quality Management in Food Industry, Bio-Accali, Inc., Madrid, Spain

A part-time position, overseeing sample collection and analysis in the Murcia region of Spain.

VETERINARY HEALTH CLINICIAN**1996**

Official College of Veterinarians, Health Department, Region of Murcia, Spain.

Responsible for the annual animal rabies vaccine campaign for the Cartagena area.

4. PROFESSIONAL EXPERIENCE - continued**ANIMAL REPRODUCTION CLINICIAN**

1989

Piensos Carn, Pozo Estrecho, Murcia, Spain

A full-time summer internship position performing artificial insemination in swine.

Committee Work & Event Leadership

Chairman of the Departmental Seminar Committee, University of Kentucky. 2006-Present.

Expert of the European Commission 7th Framework Program (FP7). 2008-Present

Committee on Diversity, Institute of Food Technologists. 2006-2009.

Standing Committee on Dairy Science and Technology, International Dairy Federation. 2006-Present.

International Award Jury, Institute of Food Technologists. 2005-Present.

Departmental Research and Graduate Studies Committee, University of Kentucky. 2005-Present.

Coordinator of a collaborative international platform for the development of an optical syneresis sensor technology for cheese making. (Republic of Ireland, Spain and USA). 2005-2009.

Director of a seven-day collaborative work session between the Universities of Murcia and Kentucky. University of Kentucky, US. 2007.

Director of a three-day collaborative work session between the Universities of Murcia and Kentucky. University of Murcia, Spain. 2005.

Conference Organization Committee for Goat Meat and Milk Technology, University of Murcia. 2002.

Coordinator, foreign faculty visits, Biosystems and Agricultural Engineering Department, University of Kentucky. 2004-Present.

Coordinator, foreign faculty visits, Food Science, Human Nutrition and Food Safety Department, University of Murcia. 1999-2000.

International student intern coordinator, Food Science, Human Nutrition and Food Safety Department, University of Murcia. 1995, 1996, 1999 & 2000.

Consulting Experience**Consultant** for design of lab scale coagulation unit and coagulation diagnostic software for monitoring milk coagulation. Reflectronics Inc., Lexington, Kentucky. 2005.**Consultant** for industrial implementation of a milk coagulation sensor for predicting cutting time in a goat cheese plant. (**Product:** CoAguLite, Reflectronics, Lexington, Kentucky; **Application:** Central Quesera Lácteos Montesinos, S.L. Jumilla, Murcia, Spain). 2002.**Consultant** for design and technology at a goat cheese plant. Approved by the Official College of Veterinarians, Murcia, Spain, 1995-1996. (*Design phase completed, project not yet implemented by client.*)***Editorial Work*****Editor.** Journal "Anales de Veterinaria de Murcia. "2005".**Referee.** Food Research International.**Referee.** International Dairy Journal.**Referee.** Journal of Dairy Research.**Referee.** Le Lait –Dairy Science and Technology.**Referee.** International Dairy Federation (IDF) Issues and Bulletins.**Referee.** Food Technology and Biotechnology Journal.**Referee.** Food and Bioprocess Technologies: An International Journal.**Referee.** Información Tecnológica.**Referee.** American Society of Agricultural Engineers (ASAE). **Three journals:** Applied Engineering in Agriculture; Journal of Agriculture Safety and Health; & Transactions of the ASAE.**Abstract reviewer.** Institute of Food Technologists. 2007-Present.

4. PROFESSIONAL EXPERIENCE - continued

Research Proposal Reviewer. European Commission. 7th Framework Program. FP7-KBBE-2007-2B. Activity: “Fork to farm: Food Nutrition and Well Being”. Theme: “Food, Agriculture and Fisheries, and Biotechnology”.

Administrator of the scientific distribution list *TecnoLac* belonging to the Spanish Network of I&D (RedIris).

Stays in International Host Institutions

USA. Department of Biosystems & Agricultural Engineering. University of Kentucky, Lexington. 2003-Present.

Republic of Ireland. Department of Biosystems Engineering. University College Dublin. 2005, 2006 and 2007, ~three months in total.

Spain. Department of Food Technology, Human Nutrition and Food Safety. 2004, one month. 2006, six days.

USA. Department of Food Science. University of Wisconsin-Madison. 2002-2003, three & one half months.

USA. Department of Biosystems & Agricultural Engineering. University of Kentucky, Lexington. 1998, 1999 & 2000, nine months total.

Argentina. Department of Biochemistry. National University of Nordeste, Corrientes. 1996, one month.

5. RESEARCH PROJECTS as P.I., Co-P.I. or COLLABORATOR

1. Uso de ingredientes funcionales como promotores de emulsiones cárnicas. Fundación Séneca. 2008.
2. Syneresis sensor technology development for curd moisture content control –Renewal application. NRI-USDA. 2008.
3. Mejora de la calidad, rendimiento quesero y seguridad alimentaria del queso de cabra mediante el empleo de un sensor de sinéresis. Fundación Séneca. 2008.
4. Development of an optical backscatter sensor technology for monitoring and controlling meat emulsion during chopping process. Kentucky Science and Engineering Foundation. 2007.
5. Development of cheese syneresis control technology for improved product consistency. The Department of Agricultural and Food. 2005.
6. Syneresis sensor technology development for curd moisture content control. NRI-USDA. 2005.
7. Sensor technology development for monitoring and control of curd syneresis. Kentucky Science and Engineering Foundation. 2003.
8. Viral peptides used to develop a model system for rapid assay probes. Kentucky Science and Engineering Foundation. 2003-2005.
9. Development of bio-active probes derived from bacteriophages. Kentucky Science and Engineering Foundation. 2002.
10. Caracterización de cuajos de cordero y optimización de sus métodos de fabricación para la recuperación de sabores tradicionales en quesos de oveja y de cabra. Spanish Ministry of Science and Technology. 2000-2002.
11. Fiber optic sensor development for Cottage cheese processing. Kentucky Science and Engineering Foundation. 1995-2001.
12. Predicción del tiempo de corte en la elaboración de queso mediante un sensor de reflectancia difusa. Fundación Séneca. 2000-2002.
13. Nuevas tecnologías en la elaboración de queso de cabra Murciano-Granadina. Comunidad Autónoma de Murcia. 1997.
14. Process and product innovation for the citrus industry. EU. 1994-1997.
15. Curvas de lactación, aptitud tecnológica de la leche para su transformación en queso y parámetros reproductivos de cabras de raza Murciano-Granadina en la Región de Murcia, en función de época de partos. INIA. 1993-1996.

6. FELLOWSHIPS, HONORS & AWARDS

1. Recipient, International Dairy Foods Association Research Award in Dairy Foods Processing, given annually by the American Dairy Science Association to recognize individuals whose research findings have allowed dairy foods processors to develop new products, to make a significant improvement in the quality, safety, or processing efficiency of dairy foods.

6. FELLOWSHIPS, HONORS & AWARDS - continued

2. Ten-months research grant in favor of a Postdoctoral Student (Daniel Álvarez Álvarez). P.I. University of Murcia. Spain. (19,260 €; US-\$29,801). 2008.
3. Officially recognized as “Individual of Extraordinary Abilities” by the EE.UU. Government (USCIS –U.S. Citizenship and Immigration Services–). Extraordinary abilities means a level of expertise indicating that the individual is one of that small percentage who have risen to the very top of the field of endeavor.
4. One and one half-year research grant. U.S Department of Agriculture. Co-P.I. and coordinator. (NRI-USDA. US-\$182,996.). 2008.
5. Three-year research grant. Fundación Séneca, University of Murcia, Spain. External consultant and coordinator. (38,800 €; US-\$56,675.).
6. Member of the Honor Society of Agriculture, Gamma, Sigma, Delta
7. Third position on the Graduate Student Paper Competition, National ADSA Dairy Foods Division. Optical measurement of curd shrinkage during cheese manufacturing. ADSA-ASAS Annual Meeting, San Antonio, Texas, USA, 8-12 July, 2007.
8. Two-year research grant. P.I. Kentucky Science and Engineering Foundation. (KSEF. \$99,996). 2007.
9. Award for the enhancement of the International Relationships at the University of Murcia. Office of International Affairs. University of Murcia. Spain. (450 €; US-\$636). 2006.
10. Graduate research fellowship for short stay at University of Kentucky in favor of graduate student (Gema Nieto). P.I. University of Murcia. Spain. (2,000 €; US-\$2,827). 2006.
11. One-year research grant in favor of a Postdoctoral Student (Daniel Álvarez Álvarez). P.I. University of Murcia. Spain. (22,240 €; US-\$31,439). 2005.
12. Five-year research position in Dairy Science. Animal Health and Dairy Laboratory, Toledo, Spain. (INIA-CC.AA-MEC, CTE/ 359772003, #93, DR-03-582.) 2004. (Competitive position awarded but declined.)
13. Three-year research grant. Department of Agriculture & Food, Rep. Ireland. External consultant and coordinator (DAF-NDP. 517,748 €: US-\$758,792) 2005.
14. Three-year research grant. U.S. Department of Agriculture. Co-P.I. (NRI-USDA. \$350,000.) 2005.
15. One-year research grant. Kentucky Science and Engineering Foundation. Co-P.I. (KSEF. \$15,000.) 2003.
16. Postdoctoral research fellowship for short stay at University of Murcia. Spanish Ministry of Education, Science & Sports. (MECD.) (675 €; US-\$846). One month. 2004.
17. Postdoctoral fellowship. Spanish Ministry of Education & Science. (MECD/ Fulbright.) (74,570 €; US-\$93,444). 2002-2004.
18. Fundación Seneca Fellowship. University of Murcia. Spain. (720,000 pts; US-\$5,423).2002.
19. Recipient, Summa Cum Laude Prize, given annually to the University’s outstanding Food Science graduate.
20. Faculty and research personnel training fellowship. University of Murcia. Spain. (5,520,000 pts; US-\$41,573). 1998-2001.
21. Three-year research grant. Fundación Seneca. Co-P.I. (3,895,500 pts; US-\$29,338) 2000.
22. Graduate research fellowship for short stay at University of Kentucky. University of Murcia. Spain. (1,666,083 pts; US-\$12,548). 1998, 1999 & 2000.
23. Research project fellowship. University of Murcia, Spain. (1,291,740 pts; US-\$9,729).1997.
24. Intercampus fellowship. Spanish Agency for International Collaboration, Spain. (200,000 pts; US-\$1,506).1996.

7. PATENTS

1. Everard, C. D., Fagan, C. C., O’Donnell, C. P., O’Callaghan, D. J., Castillo, M., Payne, F. A. A method for monitoring the syneresis reaction in cheese making using computer vision and colour measurement. U.S. Patent Application. Filed with the U.S. Patent Office on April 24, 2007.
2. Castillo, M., Fagan, C. C., O’Donnell, C. P., O’Callaghan, D. J., Payne, F. A. Online, continuous sensor and method for curd moisture content control in cheese making. U.S. Patent Application. Filed with the U.S. Patent Office on April 25, 2008.

8. SCIENTIFIC PRODUCTION*Refereed Journal Articles*

1. Fagan, C. C., O'Donnell, C. P., O'Callaghan, D. J., Castillo, M., Payne, F. A. Chemometric approach for the prediction of curd moisture and whey fat content utilizing visible-near infrared spectroscopy. *Journal of Agricultural and Food Chemistry*. Submitted.
2. Tabayehnejad, N., Castillo, M., Payne, F. A. Comparison of measurement repeatability of the Berridge clotting time method with an optical method for total-clotting activity determination. *Journal of Dairy Science*. Submitted.
3. Alvarez1, D., Castillo, M., Payne, F. A., Xiong, Y. L. A novel fiber optic sensor to monitor beef meat emulsion stability using visible light scattering. *Food Hydrocolloids*. Submitted.
4. Everard, C. D., O'Callaghan, D. J., Mateo, M. J., O'Donnell, C. P., Castillo, M., Payne, F. A. The use of colour parameters derived from an online fibre-optic sensor to monitor curd syneresis during cheesemaking. *Journal of Food Engineering*. Submitted.
5. Mateo, M. J., D.J. O'Callaghan, C. D. Everard, C. C. Fagan, C.P. O'Donnell, M. Castillo, F. A. Payne. Influence of curd cutting programme and stirring speed on the prediction of syneresis indices in cheese-making using a light scatter NIR sensor. *Journal of Food Engineering*. Submitted.
6. Talens, C., D. J. O'Callaghan, C. D. Everard, C. C. Fagan, C. P. O'Donnell, M. Castillo, F.A. Payne. Evaluation of an improved tracer method to monitor cheese curd syneresis at varying milk fat levels in a cheese vat. *Milchwissenschaft*. In press.
7. Bañón, S., Díaz, P., Nieto, G., Castillo, M., Álvarez, D. Modelling yield and texture of comminuted pork products using color and temperature. Effect of fat/lean ratio and starch level. *Meat Science*. In press.
8. Fagan, C. C., C.-J. Du, C.P. O'Donnell, M. Castillo, C. D. Everard, D.J. O'Callaghan, F.A. Payne Application Of Image Texture Analysis For Online Determination Of Curd Moisture And Whey Solids In A Laboratory Scale Stirred Cheese Vat. *Journal of Food Science*. In press.
9. Everard, C. D., O'Callaghan, D. J., Mateo, M. J., O'Donnell, C. P., Castillo, M., Payne, F. A. Effects of cutting intensity and stirring speed on syneresis and curd losses during cheese manufacture. *Journal of Dairy Science*. In press.
10. Fagan, C. C., Castillo, M., O'Donnell, C. P., O'Callaghan, D. J., Payne, F. A. 2008. On-line prediction of cheese making indices using backscatter of near infrared light. *International Dairy Journal*, 18 120-128.
11. Fagan, C. C., Castillo, M., Payne, F. A., O'Donnell, C. P., Leedy, M., O'Callaghan, D. J. 2007. Novel on-line sensor technology for continuous monitoring of milk coagulation and whey separation in cheesemaking. *Journal of Agricultural and Food Chemistry*, 55 8836-8844.
12. Ferrandini, E., Castillo, M., López, M. B., De Renobales, M., Virto, M., Hernández, I., Price, A. V., Laencina, J. Technological Characterisation of Experimental Natural Rennets Pastes. *Food Science and Technology Internacional*. In press.
13. Ferrandini, E., Castillo, M. López, M. B., Laencina, J. 2006. Modelos estructurales de la micela de caseína. *Anales de Veterinaria*. 22, 5-18.
14. Fagan, C. C., Castillo, M., Payne, F. A., O'Donnell, C. P., O'Callaghan, D. J. 2007. Effect of Cutting Time, Temperature and Calcium on Curd Moisture, Whey Fat Loses and Curd Yield by Response Surface Methodology. *Journal of Dairy Science*. 90, 4499-4512.
15. Álvarez, D., Castillo, M., Garrido, M. D., Bañón, S., Nieto, G., Díaz, P., Payne, F. A. Efecto de la composición y el tiempo de procesamiento sobre las propiedades tecnológicas y ópticas de las emulsiones cárnicas. *Anales de Veterinaria*. In press.
16. Everard, C. D., O'Callaghan, D. J., Fagan, C. C., O'Donnell, C. P., Castillo, M., Payne, F. A. 2007. Computer vision and color measurement techniques for inline monitoring of cheese curd syneresis. *Journal of Dairy Science*. 90, 3162-3170.
17. Fagan, C. C., Leedy, M., Castillo, M., Payne, F. A., O'Donnell, C. P., O'Callaghan, D. J. 2007. Development of a light scatter sensor technology for on-line monitoring of milk coagulation and whey separation. *Journal of Food Engineering*. 83, 61-67.
18. Álvarez, D., Castillo, M., Bañón, S., Garrido, M. D., Xiong, Y. L., Payne, F. A. 2007. Prediction of meat emulsion stability using reflection photometry. *Journal of Food Engineering* 82, 310-315.

8. SCIENTIFIC PRODUCTION – *continued*

19. Castillo, M., Lucey, J.A., Wang, T., Payne, F.A. (2006). Effect of temperature and inoculum concentration on gel microstructure, permeability and syneresis kinetics. Cottage cheese-type gel. *International Dairy Journal* 16, 153-163.
20. Castillo, M., Payne, F.A., Wang, T., Lucey, J.A. 2006. Effect of temperature and inoculum concentration on prediction of both gelation time and cutting time. Cottage cheese-type gel. *International Dairy Journal* 16, 147-152.
21. Castillo, M., Lucey, J.A., Payne, F.A. 2006. The effect of temperature and inoculum concentration on rheological and light scatter properties of milk coagulated by a combination of bacterial fermentation and chymosin. Cottage cheese-type gels. *International Dairy Journal* 16, 131-146.
22. Castillo, M., Payne, F.A., López, M.B., Ferrandini, E., Laencina, J. 2005. Optical sensor technology for measuring whey fat concentration in cheese making. *Journal of Food Engineering* 71, 354-360.
23. Wang, T., Lucey, J. A., Castillo, M., Payne, F. A. 2005. Predicting cottage cheese cutting time using a light backscatter sensor *Milchwissenschaft* 60, 164-167.
24. Castillo, M., Payne, F.A., López, M.B., Ferrandini, E., Laencina, J. 2005. Preliminary evaluation of an optical method for modeling the dilution of fat globules in whey during syneresis of cheese curd. *Applied Engineering in Agriculture* 21, 265-269.
25. Castillo, M., González, R., Payne, F.A., Laencina, J., López, M.B. 2005. Optical monitoring of milk coagulation and inline cutting time prediction in Murcian al Vino cheese. *Applied Engineering in Agriculture* 21, 465-471.
26. Jordán, M.J., Kevin, L. Goodner, Castillo, M., Laencina, J. (2005). Comparison of two HS-SPME fibers for the detection of volatile chemical concentration changes due to industrial processing. *Journal of the Science of Food and Agriculture* 85, 1065-1071.
27. Castillo, M., Payne, F.A., González, R., López, M.B. Laencina, J. 2003. Determinación on-line del tiempo de coagulación en leche de cabra mediante dispersión de radiación NIR. *Anales de Veterinaria* 19, 23-6.
28. Castillo, M., Payne, F.A., Hicks, C.L., Laencina, J., López, M.B. 2003. Modelling casein aggregation and curd firming in goats' milk from backscatter of infrared light. *Journal of Dairy Research* 70, 335-348.
29. Castillo, M., Payne, F.A., Hicks, C.L., Laencina, J., López, M.B. 2003. Effect of protein and temperature on cutting time prediction in goats' milk using an optical reflectance sensor. *Journal of Dairy Research* 70, 205-215.
30. Castillo, M., Payne, F.A., Hicks, C.L., Laencina, J., López, M.B. 2002. Effect of calcium and enzyme in cutting time prediction of coagulating goats' milk using a light scattering sensor. *International Dairy Journal* 12, 1019-1023.
31. Castillo, M., Payne, F.A., Hicks, C.L., López, M.B. 2000. Predicting cutting and clotting time of coagulating goat's milk using diffuse reflectance: effect of pH, temperature and enzyme concentration. *International Dairy Journal* 10, 551-562.
32. Castillo, M., Jordán, M.J., Godoy, A., Laencina, J., López, M.B. 2000. Kinetics of syneresis in fresh goat cheese. *Milchwissenschaft* 55, 566-569.
33. López, M.B., Jordán, M.J., Granados, M.V., Fernández, J.C., Castillo, M., Laencina, J. 1999. Viscosity changes during rennet coagulation of Murciano-Granadina goat milk. *International Journal of Dairy Technology* 52, 102-106.
34. Jordán, M.J., Hellín, P., Castillo, M., Laencina, J. López, M.B. 1999. Characterization and comparative study of animal rennets from different ruminants applied to goat milk. *Milchwissenschaft* 54, 144-146.
35. López, M.B., Jordán, M.J., Hellín, P. Castillo, M., Laencina, J. 1997. Kinetics of κ -casein hydrolysis by different rennet and coagulant enzymes in murciano-granadina goat milk. *Milchwissenschaft* 52, 370-373.

Non-Refereed Journal Articles

1. Ferrandini, E., López, M.B., Laencina, J., Castillo, M. Cuajos en pasta naturales en la industria quesera. *Industrias Lácteas Españolas (ILE)*. November 2007, 345 27-32.
2. Castillo, M., Álvarez, D., Nieto, G., Payne, F.A. 2007. Sensores ópticos para la monitorización de procesos en la industria quesera. *Revista ACTA-CL* 9, 10-16.

8. SCIENTIFIC PRODUCTION - continued

3. Ferrandini, E., López, M.B., Castillo, M., Laencina, J. 2005. El Futuro del sector lechero caprino. Conclusiones del symposium internacional de la Federación Internacional de Lechería. Acrimur. Revista de Información Ganadera 15, 14-16.
4. Ferrandini, E., López, M.B., Price, A.V., Castillo, M., Laencina, J. 2004. Situación y perspectivas del empleo de cuajos naturales en la elaboración de queso de cabra. Acrimur. Revista de Información Ganadera 12, 25-27.
5. Castillo, M., Payne, F.A., López, M.B., Laencina, J. 2002. Predicción del tiempo de corte en la elaboración de queso de cabra mediante técnicas de reflectancia difusa. FEAGAS (Federación Española de Asociaciones de Ganado Selecto) 20, 122-124.
6. Jordan, M.J., Castillo, M., Garrido, M.D. Laencina, J., López, M.B. 1996. Determinación de la actividad coagulante de cuajos bovinos. Revista Española de Lechería 76, 37-40.
7. Castillo, M., Jordán, M.J., Abellán, A., Laencina, J., López, M.B. 1996. Tecnología de aprovechamiento del lactosuero. Revista Española de Lechería 74, 24-30.

Refereed Book Chapters

1. Payne, F. A., Castillo M. 2007. Light backscatter sensor applications in milk coagulation. In: Encyclopedia of Agricultural, Food, and Biological Engineering. Volume 1, Edition 1, Pp. 1-5. Heldman, D., Ed. Taylor & Francis Group, Boca Raton. ISBN: 978-0-8247-0938-9 (hardback); 978-0-8247-0937-2 (electronic).
2. Castillo, M. 2006. Cutting time prediction methods in cheese making. In: Encyclopedia of Agricultural, Food, and Biological Engineering. Volume 1, Edition 1, Pp. 1-7. Heldman, D., Ed. Taylor & Francis Group, Boca Raton. ISBN: 978-0-8247-0938-9 (hardback); 978-0-8247-0937-2 (electronic).

Book (CD-ROM Format)

1. Castillo, M. 2002. Predicción del tiempo de corte en la elaboración de queso mediante dispersión de radiación de infrarrojo próximo. PhD Thesis. Ed. Servicio de Publicaciones de la Universidad de Murcia. ISBN: 84-8371-313-6.

**International Meetings & Conferences
(Posters & Oral Presentations)**

1. Everard, C. D., O'Callaghan, D. J., Mateo, M. J., O'Donnell, C. P., Castillo, M., Payne, F. A. Using on-line colour measurement in a cheese vat to predict curd moisture and yield during pressing. 2008. International Conference of Agricultural Engineering; XXXVII Congreso Brasileiro de Engenharia Agrícola. Brazil, August 31-September 4, 2008. Accepted
2. Ferrandini E., Castillo M., López M. B., Laencina J., Truchado P. Detección de la actividad coagulante en suero de queso fresco de Murcia. 2008. II International Food Safety Meeting. Murcia, Spain, February 28-March, 1 2008.
3. Fagan, C. C., O'Donnell, C. P., Everard, C. D., O'Callaghan, D. J., Castillo, M., Payne, F. A. Light Sidescatter Measurements of Cheese Whey. Providence, Rhode Island, June 29-July 2, 2008. Accepted.
4. Talens, C., O'Callaghan, D. j., O'Donnell, C. P., Castillo, M., Fagan, C. C., Everard, C. D., Payne, F. A. Evaluation of a tracer method for estimation of fat in whey during cheese curd syneresis. Providence, Rhode Island, June 29-July 2, 2008. Accepted.
5. Mateo, M. J., O'Callaghan, D. J., Everard, C. D., O'Donnell, C. P., Fagan, C. C., Castillo, M., Payne, F. A. Using light backscatter at 980 nm to determine curd moisture content at different milk fat and gel firmness levels in cheese-making. Providence, Rhode Island, June 29-July 2, 2008. Accepted.
6. Álvarez, D., Castillo, M., Payne, F. A., Xiong, Y. L. The effect of chopping time on the light backscatter intensity of beef emulsions made with different fat lean ratios. Providence, Rhode Island, June 29-July 2, 2008. Accepted.
7. Álvarez, D., Castillo, M., Payne, F. A., Xiong, Y. L. Effect of distance between optical fibers on the light backscatter intensity of beef emulsions made with different fat lean ratios. Providence, Rhode Island, June 29-July 2, 2008. Accepted.
8. Tabayehnejad, N., Castillo, M., Payne, F. A. Total milk-clotting activity measurement using infrared light backscatter. 10th International Congress on Engineering and Food (ICEF10). Viña del Mar, Chile, 20-24 April, 2008.

8. SCIENTIFIC PRODUCTION – continued

9. Fagan, C. C., Du, C.-J., O'Donnell, C. P., Castillo, M., Everard, C. D., O'Callaghan, D. J., Payne, F. A. Potential of image texture analysis for monitoring curd syneresis. 10th International Congress on Engineering and Food (ICEF10). Viña del Mar, Chile, 20-24 April, 2008.
10. Everard, C. D., O'Callaghan, D. J., O'Donnell, C. P., Castillo, M., Payne, F. A. A novel on-line colour sensor used to determine fat content in whey during curd syneresis in a pilot-scale cheese vat. 10th International Congress on Engineering and Food (ICEF10). Viña del Mar, Chile, 20-24 April, 2008.
11. Mateo, M. J., O'Callaghan, D. J., Everard, C. D., Fagan, C. C., O'Donnell, C.P., Castillo, M. The application of light reflectance at 980 nm to monitor syneresis in cheese-making. EFFoST/EHEDG Joint Conference. Lisbon, Portugal, 14-16 November, 2007.
12. Mateo, M. J., O'Callaghan, D. J., Everard, C. D., O'Donnell, C.P., Castillo, M., Payne, F. A. Using a light reflectance online sensor in the visible spectrum to measure fat level in milk. 37th Annual Research Conference – Food, Nutrition and Consumer Sciences, Cork, Ireland, 6-7 September, 2007.
13. Talens, C., Everard, C. D., O'Callaghan, D. J., O'Donnell, C.P., Castillo, M. Evaluation of a tracer method for estimation of whey volume during cheese curd syneresis. 37th Annual Research Conference – Food, Nutrition and Consumer Sciences, Cork, Ireland, 6-7 September, 2007.
14. Mateo, M. J., O'Callaghan, D. J., Everard, C. D., O'Donnell, C. P., Castillo, M., Payne, F. A. Monitoring the syneresis rate using a light backscatter sensor at different stirring speeds in a pilot scale cheese vat. IDF World Dairy Summit. Dublin, Ireland, 29 September-October 4, 2007.
15. Talens, C., Everard, C. D., O'Donnell, C. P., O'Callaghan D. J., Castillo, M., Payne, F. A. Effect of cutting and stirring on whey particle size distribution in cheese making. IDF World Dairy Summit. Dublin, Ireland, 29 September-October 4, 2007.
16. Fagan, C. C., O'Donnell, C. P., Castillo, M., Payne, F., O'Callaghan, D. J. Effect of Temperature on Fat Globule Release during Curd Shrinkage in Cheese Manufacture. IDF World Dairy Summit. Dublin, Ireland, 29 September-October 4, 2007.
17. Everard, C. D., O'Callaghan, D. J., Mateo, M. J., O'Donnell, C. P., Fagan, C. C., Castillo, M., Payne, F. A. Influence of Coagulum Cutting Mode and Curd Stirring Speed on Syneresis and Whey Solids in Pilot Scale Cheese Making. 3rd International Symposium CIGR Section VI: Food and Agricultural Products; Processing and Innovations. Naples, Italy, 24-26 September 2007.
18. Fagan, C.C., O'Donnell, C. P., O'Callaghan, D. J., Castillo, M., Payne, F. A. Development of a Near-infrared Spectroscopy Sensor for On-line Prediction of Syneresis Indices. 3rd International Symposium CIGR Section VI: Food and Agricultural Products; Processing and Innovations. Naples, Italy, 24-26 September 2007. Accepted.
19. Bañón, S., Álvarez, D., Díaz, P., Nieto, G., Garrido, M. D., Castillo, M., Payne, F., Xiong, Y. L. Control of cooking losses and texture by using emulsion temperature and reflection photometry in frankfurters manufactured with different fat and starch levels. 53rd International Congress of Meat Science and Technology. Beijing, China, 5-10 August 2007.
20. Alvarez, D., Cox, R. B., Castillo, M., Payne, F. A., Xiong, Y. L., Blanchard, S. P. Development of a novel fiber optic sensor prototype to optimize meat emulsion quality. IFT Annual Meeting and Food Expo, Chicago, Illinois, USA, 28 July-August 1, 2007.
21. Nieto, G., Castillo, M., Xiong, Y. L., Wang, L., Blanchard, S. P., Payne, F. A., Bañón, S., Garrido, M. D., Alvarez, D. The effect of fat and hydrolyzed potato protein on quality of finely comminuted meat emulsions. IFT Annual Meeting and Food Expo, Chicago, Illinois, USA, 28 July-August 1, 2007.
22. Fagan, C. C., Castillo, M., O'Donnell, C. P., O'Callaghan, D. J., Payne, F. A. Optical measurement of curd shrinkage during cheese manufacturing. ADSA-ASAS Annual Meeting, San Antonio, Texas, USA, 8-12 July, 2007. Selected for Graduate Student Paper Competition, National ADSA Dairy Foods Division.
23. Castillo, M., Fagan, C. C., Payne, F. A., O'Donnell, C. P., O'Callaghan, D. J. Optical measurement of kinetic changes in curd moisture content and whey fat concentration during syneresis in cheese manufacturing. ADSA-ASAS Annual Meeting, San Antonio, Texas, USA, 8-12 July, 2007.
24. Ferrandini, E., López, M. B., Castillo, M., De Renobales, M., Virto, M., Laencina, J. Changes in texture and flavour during the ripening of Murcian wine cheese made with lamb rennet paste. 5th International Symposium on the Challenge to Sheep and Goats Milk, Alghero/Sardinia, Italy, 18-20 April 2007.

8. SCIENTIFIC PRODUCTION - *continued*

25. Fagan, C. C., Castillo, M., O'Donnell, C. P., O'Callaghan, D. J., Payne, F. A. Sensitivity of a prototype syneresis sensor to casein micelle aggregation and curd firming during milk coagulation. 1st International Chester Food Science and Technology Conference (ICFST), Chester, United Kingdom, 10-13 April, 2007.
26. Alvarez, D., Payne, F. A., Castillo, M., Xiong, Y. L. Application of backscatter light extinction to determine the stability of beef emulsions with different fat/lean ratios. Poster. ASABE Annual International Meeting, Minneapolis, Minnesota, USA, June 17-20, 2007.
27. Nasrin Tabayehnejad (1), Manuel Castillo (2), and Fred A. Payne (3). A light scattering laboratory tester as an alternative instrument to assess Berridge milk clotting time. ASABE Annual International Meeting, Minneapolis, Minnesota, USA, June 17-20, 2007.
28. Everard, C. D., O'Callaghan, D. J., Mateo, M. J., O'Donnell, C. P., Fagan, C. C., Castillo, M., Payne, F. A. A Novel Sensor to Monitor Colour Changes during Cheese Curd Syneresis in a Vat. ASABE Annual International Meeting, Minneapolis, Minnesota, USA, June 17-20, 2007.
29. Everard, C. D., O'Donnell, C. P., Fagan, C. C., O'Callaghan, D. J., Castillo, M., Payne, F. A.. Application of computer vision to control curd and whey quality during cheese syneresis. EFFoST Annual Meeting/ Total Food, The Hague, The Netherlands, 7-9 November, 2006.
30. Fagan, C. C., Leedy, M., Castillo, M., Payne, F.A., O'Donnell, C., O'Callaghan, D. Predicting curd moisture content, whey fat concentration and curd yield from near infrared light backscatter. ADSA-ASAS Annual Meeting, Minneapolis, Minnesota, USA, 9-13 July, 2006.
31. Everard, C. D., O'Donnell, C. P., Fagan, C. C., O'Callaghan, D. J., Castillo, M., Payne, F. A.. Computer vision analysis to monitor syneresis of cheese curd in a cheese vat. ADSA-ASAS Annual Meeting, Minneapolis, Minnesota, USA, 9-13, July, 2006.
32. Álvarez, D., Fagan, C. C., Garrido, M. D., Bañón, S., Xiong, Y. L., Payne, F. A., Castillo, M. Application of reflection photometry for determining meat emulsion stability. IFT Annual Meeting and Food Expo, Orlando, Florida, USA, 24-28 June 2006.
33. Fagan, C. C., Leedy, M., Castillo, M., Payne, F.A., O'Donnell, C., O'Callaghan, D. The effect of temperature, cutting time and calcium chloride addition on yield and fat retention of fresh curd. IFT Annual Meeting and Food Expo, Orlando, Florida, USA, 24-28 June 2006.
34. Fagan, C. C., Leedy, M., Castillo, M., Payne, F.A., O'Donnell, C., O'Callaghan, D. Application of response surface methodology for the development of a light scatter sensor technology for concurrent monitoring of milk coagulation and whey separation. 2nd International Symposium CIGR Section VI: Future of Food Engineering. Warsaw, Poland, 26-28 April 2006.
35. Castillo, M., Torrealba S., Payne, F.A. A Review of the models for description of whey separation during cheese making. ASABE Annual International Meeting. Portland, Oregon, USA, 9-12 July 2006.
36. Payne, F.A., Chandler, G., Castillo, M., Danao, G. Intelligent Optical Sensor for In-Line Food Processing Applications. ASABE Annual International Meeting. Portland, Oregon, USA, 9-12 July 2006.
37. Castillo, M., Ferrandini, E., Payne, F.A., Laencina, J., López, M.B. Cheese making process control using optical sensor technologies. International Food Safety Meeting. Murcia, Spain, 17-19 November 2005.
38. Castillo, M., Torrealba, S., Payne, F. A. A one-dimensional model of curd syneresis based on viscoelastic properties of curd. ADSA Annual Meeting. Cincinnati. Ohio, USA, 24-28 July 2005.
39. Castillo, M., Payne, F.A., Shea, A. Development of a combined sensor technology for monitoring coagulation and syneresis operations in cheese making. ADSA Annual Meeting. Cincinnati. Ohio, USA, 24-28 July 2005.
40. Ferrandini, E., Castillo, M., López, M.B., Laencina, J. A review of the models for the structure of the casein micelle. ADSA Annual Meeting. Cincinnati. Ohio, USA, 24-28 July 2005.
41. Castillo, M., Payne, F.A. Review of the light backscatter sensor technology for milk coagulation monitoring. ASAE/ CSAE Annual International Meeting. Tampa, Florida, USA, 17-20 July 2005.
42. Payne, F.A., Danao, M.G., Castillo, M. Light backscatter extinction measurements for predicting fat and protein content of milk. ASAE/ CSAE Annual International Meeting. Tampa, Florida, USA, 17-20 July 2005.
43. Castillo, M., Lucey, J.A., Wang, T., Payne, F.A. Light backscatter properties of mixed gels induced by bacterial fermentation and chymosin. IFT Annual Meeting and Food Expo, New Orleans, Louisiana, USA, 16-20 July 2005.

8. SCIENTIFIC PRODUCTION - continued

44. Ferrandini, E., Price, A., Castillo, M., Laencina, J., López, M.B. 2004. Ácidos grasos de cabra murciano-granadina en la región de Murcia. Influencia de la zona geográfica de explotación. International Symposium on the future of the sheep and goat dairy sectors. IDF-CIHEAM. Zaragoza, Spain, 28-30 October 2004.
45. Payne, F.A., Castillo, M. 2004. Light backscatter and extinction during milk coagulation in the UV/ VIS/ NIR region. ASAE/ CSAE Annual International Meeting. Ottawa, Canada, 1-4 August 2004.
46. Castillo, M., Payne, F.A., Lucey, J.A. 2004. Gelation time and curd setting predictions on cottage cheese by light backscatter. ASAE/ CSAE Annual International Meeting. Ottawa, Canada, 1-4 August 2004.
47. Castillo, M., Lucey, J.A., Wang, T., Payne, F.A. 2004. Gel microstructure, permeability, and syneresis kinetics of cottage cheese-type gels made under different gelation rates. 2004 ADSA Annual Meeting. St. Louis, Missouri, USA, 25-29 July 2004.
48. Castillo, M., Lucey, J.A., Payne, F.A. 2004. Rheological and light scattering properties of cottage cheese-type gels made under different gelation rates. 2004 ADSA Annual Meeting. St. Louis, Missouri, USA, 25-29 July 2004.
49. Wang, T., Lucey, J.A., Castillo, M., Payne, F.A. 2004. Predicting the cutting time of cottage cheese using a backscatter sensor. IDF Symposium on cheese: ripening, characterization and technology. Prague, Czech Republic, 21-25 March 2004.
50. Castillo, M., Payne, F.A., López, M.B., Ferrandini, E., Laencina, J. 2004. Kinetic of syneresis during goats' cheese manufacturing. 9th International Congress on Engineering and Food (ICEF9). Montpellier, France, 7-11 March 2004.
51. Castillo, M., Payne, F.A., López, M.B., Ferrandini, E., Laencina, J. 2004. Development of a fiber optic sensor to measure low fat concentration in goats' whey. 9th International Congress on Engineering and Food (ICEF9). Montpellier, France, 7-11 March 2004.
52. Payne, F.A., Castillo, M., Gillette, K.S., Crofcheck, C.L. 2002. Fiber optic measurement of light extinction coefficient for quantifying fat content in milk and cream. Symposium on emerging Technologies for the Food Industry (EMERTEC 2002). Madrid, Spain, 11-13 March 2002.
53. Castillo, M., Payne, F.A., López, M.B., Laencina, J. 2002. Diffuse reflectance of near-infrared radiation: a new method for Berridge clotting time determination on cheese making. Symposium on emerging Technologies for the Food Industry (EMERTEC 2002). Madrid, Spain, 11-13 March 2002.
54. Payne, F.A., Castillo, M., Crofcheck, C.L. 2000. Modeling the backscatter changes during enzymatic coagulation of milk. 8th International Congress on Engineering and Food. Puebla, Mexico, 9-13 April 2000.
55. Castillo, M., Jordan, M.J., Bañón, S., Garrido, M.D., Laencina, J. 1996. Rendimiento quesero en la elaboración de queso fresco de cabra Murciano-Granadina. Influencia de la enzima utilizada. Internacional Simposium EAAP-CIHEAM-FAO. Badajoz, Spain, 28 September-2 October 1996.

***Local Meetings & Conferences
(Posters & Oral Presentations)***

1. Castillo, M., Payne, F.A., Mençüç, M.P. Syneresis sensor technology for curd moisture content control in cheese making. **Poster.** Lexington, Kentucky, USA, 17 April 2008.
2. Álvarez, D., Castillo, M., Payne, F. A., Xiong, Y. L. Control of beef emulsion stability using visible light backscatter and color. **Poster.** Lexington, Kentucky, USA, 17 April 2008.
3. Álvarez, D., Castillo, M., Garrido, M. D., Bañón, S., Nieto, G., Díaz, P. Payne, F. A., Xiong, Y. L. 2007. Influence of fat to lean ratio and starch concentration on optical properties, quality and yield of hot dogs. International Scholars Poster Session. **Poster.** Lexington, USA, 20-22 February 2007.
4. Fagan, C. C., Castillo, M., Payne, F. A., O'Donnell, C. P., O'Callaghan, D. J. 2007. On line curd moisture content control for cheese manufacture. International Scholars Poster Session. **Poster.** Lexington, USA, 20-22 February 2007.
5. Nieto, G., Castillo, M., Xiong, Y. L., Payne, F. A., Álvarez, D., Wang, L., Garrido, M. D., Bañón, S. 2007. The influence of fat and hydrolyzed potato protein on meat quality: correlation between color properties and quality of emulsions. International Scholars Poster Session. **Poster.** Lexington, USA, 20-22 February 2007.
6. Ferrandini, E., Castillo, M., López, M. B., De Renobales, M., Virto, M., Hernández, I., Price, A. V., Laencina, J. Caracterización tecnológica de cuajos naturales en pasta experimentales. IV Congreso de Ingeniería y Tecnología de Alimentos, CESIA 2006. Poster. Córdoba, Spain, 8-10 November 2006.

8. SCIENTIFIC PRODUCTION - continued

7. Everard, C. D., O'Callaghan, D. J., Fagan, C. C., O'Donnell, C. P., Castillo, M., Payne, F. A.. Reflection photometry and physico-chemical measurements to monitor cheese curd syneresis. 36th Annual Research Conference. Food, Nutrition and Consumer Sciences. **Poster**. Cork, Ireland, 14 September, 2006.
8. Castillo, M., Payne, F. A., Fagan, C. C., Leedy, M., O'Donnell, C. P., O'Callaghan, D. J. Backscatter of near infrared light as an instrument to improve control of curd moisture content during cheese manufacturing. International Scholar Poster Session. **Poster**. Lexington, USA, 22 February 2006.
9. Price, A., López, M.B., Castillo, M., Megías, M.D., Hernández, F., Laencina, J. Ferrandini E. Aspectos saludables de la leche de cabra murciano-Granadina. Ácidos grasos. III Jornadas de Actualización en Alimentación y Salud. **Poster**. Murcia, Spain, 20-21 October, 2005.
10. Ferrandini, E. Castillo, M., Price, A.V., Laencina, J., López, M.B. Estudio del empleo de cuajos naturales en leche de cabra y vaca. III Congreso Nacional de Ciencia y Tecnología de los Alimentos. **Poster**. Burgos, Spain, 29 May-1 June 2005.
11. Castillo, M., Payne, F.A., Mençüç, M.P. Simultaneous monitoring of coagulation and syneresis in cheese processing using light backscatter. Third Annual Kentucky Innovation and Enterprise Conference. **Poster**. Louisville, Kentucky, USA, 30 March 2005.
12. Castillo, M., Payne, F. A., Mençüç, M.P., Leedy, M.A novel optical sensor technology for simultaneous monitoring of coagulation and syneresis in cheese processing. **Poster**. Third International Affairs Research Scholar Poster Session. Poster. Lexington, USA, 24 February 2005.
13. Castillo, M., Payne, F.A., López, M.B., Ferrandini, E., Laencina, J. Sensores ópticos para la monitorización y control de procesos en la elaboración de queso. III Congreso Español de Ingeniería de Alimentos, CESIA 2004. **Poster**. Pamplona, Spain, 15-17 September 2004.
14. Castillo, M., Payne, F.A., Mençüç, M.P. 2004. Syneresis sensor technology development for curd moisture content control. Second Annual Kentucky Innovation and Enterprise Conference. **Poster**. Lexington, USA, 3 March 2004.
15. Castillo, M., Payne, F.A., Mençüç, M.P. 2004. Large field of view light backscatter sensor for monitoring whey syneresis and control curd moisture content. Second International Scholar Poster Session. **Poster**. Lexington, USA, 14 April 2004.
16. Castillo, M., Payne, F.A., López, M.B., Laencina, J. 2003. Measurement of rennet clotting time using a fiber optic backscatter sensor. International Scholar Poster Session. **Poster**. Lexington, USA, 16 April 2003.
17. Ferrandini, E., Castillo, M., Price, A., Alvarez, D., Mansilla, S., López, M.B. 2003. Características de la leche de cabra Murciano-Granadina en la Región de Murcia. II Congreso Nacional de Ciencia y Tecnología de los Alimentos. **Poster**. Orihuela, Spain, 3-6 June 2003.
18. López, M.B., Castillo, M., Bañón, S., González, R. 2002. Importancia de la calidad tecnológica de la leche. XIX Reunión gTemcal. **Oral presentation**. Palencia, Spain, 25-26 October 2002.
19. López, M.B., Castillo, M., Bañón, S., Jordán, M.J., Garrido, M.D., Laencina, J. 2002. Conservación de la actividad coagulante mediante aplicación del frío. I Congreso Español de Ciencias y Técnicas del Frío. **Poster**. Cartagena, Spain, 4-6 April 2002.
20. Castillo, M., Payne, F., González, R., Linares, B., López, M.B., Laencina, J. 2001. Monitorización de la coagulación de leche de cabra. I Congreso Nacional de Ciencia y Tecnología de los Alimentos. **Poster and oral presentation**. Granada, Spain, 30 May-1 June 2001.
21. Castillo, M., Jordán, M.J., Hellín, P., López, M.B., Laencina, J. 1995. Estructura productiva de leche y queso de cabra Murciano-Granadina en la Región de Murcia. XX Jornadas científicas de la Sociedad Española de Ovinotecnia y Caprinotecnia. **Oral presentation**. Madrid, Spain, 25-27 September 1995.

Meetings & Conferences
(Conference Proceedings)

1. Ferrandini, E. Castillo, M., Price, A. V., Laencina, J., López, M. B. 2005. Estudio del empleo de cuajos naturales en leche de cabra y vaca. In Avances de la Ciencia y Tecnología de los Alimentos en los Inicios del Siglo XXI. Productos tradicionales y tipificación de alimentos. Pp. 1023-1026. Ed. Servicio de Publicaciones, Universidad de Burgos. ISBN: 84 96394 23-9.
2. Castillo, M., Payne, F. A., López, M. B., Laencina, J. 2005. Optical sensors to monitor and control the processing of goat cheese. In Special Issue of the International Dairy Federation 0501/Part4. Pp. 250-256. Ed. International Dairy Federation. ISBN: 92 9098 039-7.

8. SCIENTIFIC PRODUCTION - continued

3. Ferrandini, E., Price, A., Castillo, M., Laencina, J., López, M. B. 2005. Fatty acids of Murciano-Granadina goats' milk from the Region of Murcia. Influence of the farming area. In Special Issue of the International Dairy Federation 0501/Part3. Pp. 158-159. Ed. International Dairy Federation. ISBN: 92 9098 039-7.
4. Castillo, M., Payne, F. A., López, M. B., Ferrandini, E., Laencina, J. 2004. Sensores ópticos para la monitorización y control de procesos en la elaboración de queso. In Actas del III Congreso Español de Ingeniería de Alimentos. [CD-Rom]. ISBN: 84-688-7989-4.
5. Castillo, M., Payne, F. A., López, M. B., Ferrandini, E., Laencina, J. 2004. Kinetics of syneresis during goats' cheese manufacturing. In Actas del 9th International Congress on Engineering and Food. [CD-Rom]. Montpellier.
6. Castillo, M., Payne, F. A., López, M. B., Ferrandini, E., Laencina, J. 2004. Development of a fiber optic sensor to measure low fat concentration in goats' whey. In Actas del 9th International Congress on Engineering and Food. [CD-Rom]. Montpellier.
7. López, M.B., Castillo, M., Bañón, S., Jordán, M. J., Garrido, M. D., Laencina, J. 2003. Conservación de la actividad coagulante mediante la aplicación del frío. In Avances en ciencias y técnicas del frío. Pp. 401-404. Ed. Ed. López, A., Esnoz, A., Artés, F. ISBN: 84-95781-17-4.
8. Ferrandini, E., Castillo, M., Prince, A., Alvarez, D., Mansilla, S., López, M. B. 2003. Características de la leche de cabra murciano-granadina en la región de Murcia. In II congreso nacional de ciencia y tecnología de los alimentos. Volume I. Pp. 413-416. Ed. Universidad Miguel Hernández. ISBN: 84-95893-75-4.
9. Castillo, M., Jordan, M.J., Bañón, S., Garrido, M.D., Laencina, J., López, M.B. 1998. Effect of different coagulant enzymes in Murciano-Granadina fresh goat cheese. Influence on cheese yield. In Basis of the quality of typical Mediterranean animal products. E.A.A.P. Publication N° 90. Pp. 244-248. Ed. Wageningen Pers. ISBN: 90-74737-53-X.
10. Castillo, M., Jordán, M.J., Hellín, P., López, M.B., Laencina, J. 1997. Estructura productiva de leche y queso de cabra Murciano-Granadina en la Región de Murcia. In Producción ovina y caprina. N° XX- SEOC. Pp. 491-496. Ed. Delegación Regional Central de la Sociedad Española de Ovinotecnia y Caprinotecnia y Sociedad Española de Ovinotecnia y Caprinotecnia. ISBN: 84-922040-01.

Other publications

1. Castillo, M. (Reviewer/Contributing author as a member of the Standing Committee of Dairy Science and Technology). 2007. Coagulation of milk: Processes and Characteristics. Bulletin of the International Dairy federation, 420, 1-28.

Seminars & Invited Conferences

1. **Invited lecture at USDA Project Director's Meeting.** Syneresis sensor technology development for curd moisture content control. New Orleans. June , 2008.
2. **Invited lecture at California Polytechnic State University.** Development of a syneresis sensor technology development for curd moisture content control. San Luis Obispo, California, January 30, 2008.
3. **Invited lecture at California Polytechnic State University.** Emerging trends, opportunities and challenges in the milk and dairy products sector. San Luis Obispo, California, January 29, 2008.
4. **Invited lecture at University of Tennessee.** Sensor technology development for cheese process control. Tennessee, November 21, 2006.
5. **Invited lecture at USDA Project Director's Meeting.** Syneresis sensor technology development for curd moisture content control. Washington. August 8, 2006.
6. **Seminar.** Laboratory coagulation tester. Dublin, November 23, 2005.
7. **Seminar.** Simultaneous monitoring of milk coagulation and syneresis using light backscatter techniques. Dublin, November 23, 2005.
8. **Seminar.** Syneresis sensor technology development. Current status of research. Murcia, November 3-7, 2005.
9. **Seminar.** Coagulímetro de laboratorio "CoAguLab". Murcia, November 3-7, 2005.
10. **Seminar.** Syneresis project background, objectives and work plan. Lexington, May 16-20, 2005.
11. **Seminar.** Rheological, optical and microstructural properties and syneresis of gels made by combination of bacterial fermentation and chymosin. Lexington, May 16-20, 2005.

8. SCIENTIFIC PRODUCTION - *continued*

12. **Invited lecture at Conference.** Optical sensor technologies to monitor and control the processing of goat cheese. Symposium on the evolution of the sheep and goat dairy sector. Zaragoza, Spain, 2004.
13. **Seminar.** Cottage cheese culture monitoring and control. University of Kentucky, 2003.
14. **Seminar.** Cutting time prediction in goat cheese using backscatter of NIR radiation. University of Wisconsin-Madison. 2002.
15. **Invited Lecture at Conference.** Alternativas en la comercialización de la leche de cabra. SEPOR'02. Lorca, Spain, 2002.
16. **Invited Lecture at Conference.** Calidad tecnológica de leche de cabra. Lorca, Spain, 2002.
17. **Invited Lecture at Conference.** Características tecnológicas de la leche de cabra. University of Murcia, Spain, 2002.
18. **Seminar.** Cutting time prediction and kinetics of aggregation and curd firming by backscattered near infrared radiation in goat milk coagulation. University of Kentucky, 2000.
19. **Invited Round Table.** Aplicación de sensores de fibra óptica en la determinación del tiempo de corte en las Industrias Queseras. University of Murcia, Spain, 2000.
20. **Seminar.** Predicción de los tiempos de coagulación y de corte en leche de cabra mediante el empleo de reflectancia difusa. University of Murcia, Spain, 2000.
21. **Seminar.** University of Murcia Structure. University of Kentucky, 1998.

Press releases

1. Photonics Spectra. Photonics.com. Using photonics to solve problems of the real world. Monitoring cheese while making it. Electronic journal. December 2007.
2. Today's Farm. Moorepark open day. Volume 18, Number 4, July-August 2007. Pp. 6-7.
3. T-Research. Moorepark open day. Volume 2, Number 3, Autumn 2007. Pp. 5.
4. Actualidad Informativa, Universidad de Murcia. Gabinete de Prensa. Una tesis doctoral propone una nueva elaboración del queso de Murcia. Ref. 3533/2006. 19/7/2006.
5. La Verdad.es. Una tesis doctoral presentada en la UMU propone una nueva elaboración del queso de Murcia. 19/7/2006.
6. Web Page of the Department of Biosystems and Agricultural Engineering. News and Events Section. 2005.
7. The BAE LINK. Biosystems and Agricultural Engineering Department, Universidad de Kentucky. Research highlights. Fall 2004. Pp. 8.
8. The BAE LINK. Biosystems and Agricultural Engineering Department, Universidad de Kentucky. New faces at BAE. Fall 2004. Pp. 2.
9. The BAE LINK. Biosystems and Agricultural Engineering Department, Universidad de Kentucky. New faces at BAE. Fall 2003. Pp. 3.
10. The BAE LINK. Biosystems and Agricultural Engineering Department, Universidad de Kentucky. BAE World travelers. Fall 2002. Pp. 7.
11. The BAE LINK. Biosystems and Agricultural Engineering Department, Universidad de Kentucky. Visiting Scientists in BAE. Summer 2001. Pp. 9.
12. Información Veterinaria. Un sensor de fibra óptica en la elaboración de queso. April 2002. Pp. 49.
13. La Chuleta (La Verdad de Murcia). Una tesis recurre a la fibra óptica para fabricar queso. 3/6/2002. Pp. 3.
14. La Opinión de Murcia. Tecnología aplicada a los quesos. 3/12/2002. Pp. 28.
15. La Opinión de Murcia. Quesos con mucha vista. 3/11/2002. Pp. 20.
16. The BAE LINK. Biosystems and Agricultural Engineering Department, Universidad de Kentucky. BAE faculty world travelers. Summer 2001. Pp. 11.
17. The magazine. College of Agriculture. Universidad de Kentucky. Fall 2000. Pp. 17.

9. PROFESSIONAL AFFILIATIONS***Organizational Memberships***

1. Institute of Food Technologists (IFT).
2. American Dairy Science Association (ADSA).
3. International Dairy Federation (IDF-FIL).

9. PROFESSIONAL AFFILIATIONS - continued

4. American Chemical Society (ACS).
5. American Society of Agricultural Engineers (ASABE).
6. International Goat Association (IGA).
7. Honor Society of Agriculture Gamma, Sigma, Delta ($\Gamma\Sigma\Delta$).
8. Spanish Food Scientists and Technologists Association (ALCYTA).
9. Castilla-León Food Scientists and Technologists Association (ACTA-CL).
10. Young Researcher Association of Murcia (AJIMUR).
11. Official College of Doctors in Veterinary Medicine of Murcia (COLVET).
12. Virtual Veterinary Science Community (Veterinaria.org).

Scientific E-mail Lists

TecnoLac, Cytali, ADMIN.-ALIM, Vacas-L, Panaligon, Diseven, Dairy-L, ADMIN, Microal

10. PROFESSIONAL DEVELOPMENT

1. IFT International Nanoscience Course. 2007.
2. Supervision. 2006.
3. Chemical Hygiene Plan (Lab. Safety). 2004.
4. Principles of Near-Infrared Spectroscopy for Applied Research. 2004.
5. Visual Basic 6.0. 2004.
6. DC Circuits and Microelectronics. 2004.
7. Applying Data Mining Techniques Using Enterprise Miner. 2004.
8. New Technologies and Education Perspectivas. 2003.
9. Spectroscopic Solutions Seminar. 2003.
10. Jornadas Sobre Comida Segura. 2001.
11. Curso Sobre Aditivos y su Aplicación en la Industria Alimentaria. 1997.
12. Agua Purificada para Aplicaciones de Laboratorio. 1995.
13. Curso Teórico-Práctico de Microanálisis en Microscopía Electrónica de Barrido. 1995.
14. Control de Calidad en la Industria Alimentaria. 1994.
15. Cría y Salud del Ganado Porcino. 1993.
16. Análisis Clínicos. 1991.
17. Jornadas de Colombicultura. 1991.
18. Ecopatología y Manejo de Aves Silvestres y Compañía. 1991.