

# Curriculum Vitae

**David S. Jackson, Ph.D.**

Department of Food Science and Technology  
University of Nebraska–Lincoln  
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## EMPLOYMENT HISTORY:

*University of Nebraska*

**Professor (60% Research, 30% Extension, 10% Teaching)**

Dept. of Food Science and Technology

July 2001 – Present

**Interim Department Head**

Dept. of Food Science and Technology

November 2004 – March 2006

**(Administrative) Intern**

Agricultural Research Division (ESCOPE/ACOP Leadership Development Program)

July 2001 – June 2002

**Associate Professor (July 1994 – June 2001)**

**Assistant Professor (January 1989 – June 1994)**

## EDUCATION:

Ph.D., December 1988, Texas A&M University

Department of Soil & Crop Sciences

Major: Food Science & Technology (Starch Chemistry)

(*Graduate Research & Teaching Assistant*, January 1987-December 1988)

M.S., December 1986, Texas A&M University

Department of Soil & Crop Sciences

Major: Food Science & Technology (Alkaline Cooking/Corn Quality)

(*Graduate Research & Teaching Assistant*, January 1985-December 1986)

B.S., May 1984, Cornell University

Department of Food Science

Major: Food Science (Science Option)

## OTHER LEADERSHIP AND EMPLOYMENT ACTIVITIES:

Professional Organization Service:

NC-213 Regional Research Project: Chair (2005-2006), Vice-Chair (2004-2005), Station Representative (2007-present)

IFT: Carbohydrate Division Chair (1997-1998, and other offices)

AACC: Carbohydrate Division Chair (2003-2004) & Symposium Organizer (2002-2003)

AACC: Associate Editor, *Cereal Chemistry* (3 terms: 1995-2000, 2006-present)

University Service:

UNL Conflict of Interest in Research Committee (Member: 2006-present)

UNL Web Advisory Committee (Member: 2006-present)

Academic Senate Representative (currently serving), Secretary (2000/2001)

UNL Computational Services and Facilities Committee (Member, Chair: 2002-2005)

UNL Student Judicial Board (Member: 2005 - present)

FDST Graduate Committee (Member: 1994 – 2000, Chair: July 1996-June 1998)

## **CURRENT EDUCATIONAL ACTIVITIES (TEACHING AND EXTENSION):**

**Workshops:** Coordinate and deliver nationally-attended workshops devoted to:

Extrusion Processing (16 years) <http://fpc.unl.edu/Workshops/appliedextrusion.shtml> and

Ingredient Functionality (15 years) <http://fpc.unl.edu/Workshops/ingredients.shtml>

**Traditional and Distance Education Instruction:** Concepts of Product Development (FDST 460/860), Animal, Food and Industrial Uses of Grain (Team Taught, Agro 437/837), Edible Dry Bean Processing (Prototype Web Course)

**Client Assistance:** Provide analytical and processing assistance to industry clients worldwide in areas associated with starch analysis and chemistry, tortilla processing, grain evaluation and quality, and extrusion technologies.

**Graduate Student Mentorship (1989-present):** 6 Ph.D. degrees and 13 MS degrees completed; 3 MS & 2 Ph.D. in progress.

## **SELECTED AWARDS:**

Tortilla Industry Association “2004 Best Paper Award – 1<sup>st</sup> Place” for a presentation at the 2004 AACC Annual Meeting titled: *Wheat tortilla textural property and formula optimization.*

Tortilla Industry Association “2002 Excellence In Research Award”

Corn Refiners Association “Outstanding Presentation in Cereal Chemistry Award,” Presented November 1999 for a paper titled: *Starch Chromatography: Assessing Starch Functionality, Fine-Structure and Interactions in Model or Food Systems.*

## **CURRENT RESEARCH ACTIVITIES:**

*Starch Technology: Production, Characterization, and Utilization.* Hatch Project NEB16051, Principal Investigator. (Approved, January 1, 2005; Expires December 31, 2009.)

*Molecular Characterization of Starch Polymers*

*Physicochemical Properties of Starch Granules and Other Starch Structures*

*Marketing and Delivery of Quality Cereals and Oilseeds.* Regional Project NC-213. Co-Principal Investigator for Nebraska's Contribution

*Corn and Sorghum Quality Characterization*

*Corn and Sorghum Processing Chemistry and Optimization*

*Improving Ethanol Production Efficiency: Optimization of Corn-based Feedstock Energy Conversions.* Nebraska Center for Energy Sciences Research, Project 06-102.

## **RESEARCH FUNDING SOURCES** (Groups funding research during some period between 1989-present):

National Science Foundation / Environmental Protection Agency [\$211,748]

Tortilla Industry Association\*

Mexican Government (CONASUPO)\* [\$529,829]

Nebraska Corn Board\*

Nebraska Wheat Board

Nebraska Sorghum Board\*/National Sorghum Board

INTSORMIL\* (An international Sorghum/Millet research project) [\$526,066]

Nebraska Dry Bean Commission\*

National Honey Board\*

USDA - Midwest Advanced Food Manufacturing Alliance (Subproject)

The Ohio State University (The Andersons Research Grants)\*

Nebraska Center for Energy Sciences Research

Industrial and Entrepreneurial Clients/Projects\*

\*Multiple Grants.

## **COURTESY ACCADEMIC APPOINTMENT:**

**Professor,** Department of Agronomy and Horticulture  
University of Nebraska

## **PUBLICATIONS:**

### *Journal Articles*

Jackson, D.S. and Rooney, L.W. 1987. Rapid determination of moisture in masa with a domestic microwave oven. *Cereal Chemistry* 64(3):196-198.

Jackson, D.S., Rooney, L.W., Kunze, O.R. and Waniska, R.D. 1988. Alkaline processing properties of stress-cracked and broken corn (*Zea Mays L.*). *Cereal Chemistry* 65(2):133-137.

Jackson, D.S., Choto-Owen, C., Waniska, R.D., and Rooney, L.W. 1988. Characterization of starch cooked in alkali by aqueous high-performance size-exclusion chromatography. *Cereal Chemistry* 65(6):493-496.

Jackson, D.S., Waniska, R.D., and Rooney, L.W. 1989. Differential water-solubility of corn and sorghum starches as characterized by hplc-size exclusion chromatography. *Cereal Chemistry* 66(3):228-232.

Jackson, D.S., Gomez, M.H., Waniska, R.D. and Rooney, L.W. 1990. Effects of single-screw extrusion on starch as measured by aqueous high-performance size exclusion chromatography. *Cereal Chemistry* 67(6):529-532.

Ling, Du and Jackson, D.S. 1991. Corn wet milling with a commercial enzyme preparation. *Cereal Chemistry* 68(2):205-206.

Jackson, D.S. 1991. Solubility behavior of granular corn starches in methyl sulfoxide (DMSO) as measured by high-performance size exclusion chromatography. *Starch/Stärke*: 43(11):422-427.

Jackson, D.S., Waniska, R.D. and Rooney, L.W. 1992. Molecular weight patterns of Nägeli amyloextrins. *Starch/Stärke*: 44(2): 59-61.

Zhang, W. and Jackson, D.S. 1992. Retrogradation behavior of wheat starch gels with differing molecular profiles. *Journal of Food Science*: 57(6):1428-1432.

Shandera Jr., D.L. and Jackson, D.S. 1993. A simplified method for measurement of lactic acid and sulfur dioxide in corn wet milling steep liquor. *Starch/ Stärke*: 45(10):351-354.

Wehling, R.L, Jackson, D.S., Hooper, D.G. and Ghaedian, A.R. 1993. Prediction of wet-milling starch yield from corn by near infrared spectroscopy. *Cereal Chemistry* 70(6):720-723.

Sahai, D. and Jackson, D.S. 1994. Structure and chemical properties of partially heated corn starch granules. *Starch/Stärke* 46(12):457-463.

Mua, J-P. and Jackson, D.S. 1995. Gelatinization and solubility properties of commercial oat starch. *Starch/Stärke* 47(1):2-7.

Mokhoro, C.T. and Jackson, D.S. 1995. Starch related changes in stored soft sorghum porridges. *Journal of Food Science* 60(2): 399-404.

Shandera Jr., D.L., Parkhurst, A.M. and Jackson, D.S. 1995. Interactions of sulfur dioxide, lactic acid, and temperature during simulated corn wet milling. *Cereal Chem.* 72(4):371-378.

Mua, J-P. and Jackson, D.S. 1995. Fractionation of regular corn starch: A comparison of aqueous leaching and aqueous dispersion methods. *Cereal Chem.* 72(5):508-511.

Sahai, D. and Jackson, D.S. 1996. Structural and Chemical Properties of Native Corn Starch Granules. *Starch/Stärke* 48:249-255.

Shandera, D.L. and Jackson, D.S. 1996. Effect of Corn Wet-Milling Conditions (Sulfur Dioxide, Lactic Acid, and Steeping Temperatures) on Starch Functionality. *Cereal Chem.* 73:632-637.

Wehling, R.L., Jackson, D.S. and Hamaker, B.R. 1996. Prediction of Corn Dry-Milling Quality by Near-Infrared Spectroscopy. *Cereal Chem.* 73:543-546

Mua, J.P. and Jackson, D.S. 1997. Fine structure of corn amylose and amylopectin fractions with various molecular weights. *J. Agric. Food Chem.* 45: 3840-3847.

Mua, J.P. and Jackson, D.S. 1997. Relationships between functional attributes and molecular structures of amylose and amylopectin fractions from corn starch. *J. Agric. Food Chem.* 45: 3848-3854

- Mua, J.P., Rosowski, J.R. and Jackson, D.S. 1997. Initial Phase Solubilization of Normal Corn Starch by Methyl Sulfoxide (DMSO): Evidence from Scanning Electron Microscopy and Size Exclusion Chromatography. *Starch* 49:401-407.
- Shandera, D.L., Jackson, D.S. and Johnson, B.E. 1997. Quality factors impacting processing of maize dent hybrids. *Maydica* 42:281-289.
- Mua, J-P. and Jackson, D.S. 1998. Retrogradation and gel textural attributes of corn starch amylose and amylopectin fractions. *Journal of Cereal Science* 27:157-166.
- Sahai, D. and Jackson, D.S. 1999. Enthalpic transitions in native starch granules. *Cereal Chem.* 76:444-448.
- Sahai, D. Mua, J.P., Surjewan, I., Buendia, M.O., Rowe, M. and Jackson, D.S. 1999. Assessing degree of cook during corn nixtamalization: Impact of processing variables. *Cereal Chem.* 76:850-854.
- Osman, M.G., Sahai, D. and Jackson, D.S. 2000. Oil absorption characteristics of a multi-grain extrudate during frying: Impact of extrusion temperature and screw speed. *Cereal Chem.* 77(2):101-104.
- Sahai, D., Surjewan, I., Mua, J.P., Buendia, M.O., Rowe, M. and Jackson, D.S. 2000. Dry matter loss during nixtamalization of a white corn hybrid: Impact of processing parameters. *Cereal Chem.* 77(2):254-258.
- Lochte-Watson, K., Weller, C.L. and Jackson, D.S. 2000. Fractional composition, with emphasis on wax content, of grain sorghum (*Sorghum bicolor*) following abrasive decortication. *J. Agric. Engr. Research.* 77(2) 203-208.
- Sahai, D., Buendia, M.O. and Jackson, D.S. 2001. Analytical Techniques For Understanding Nixtamalized Corn Flour: Particle Size and Functionality Relationships in a Masa Flour Sample. *Cereal Chem.* 78(1):14–18.
- Sahai, D., Mua, J.P., Surjewan, I., Buendia, M.O., Rowe, M. and Jackson, D.S. 2001. Alkaline processing (*Nixtamalization*) of white mexican corn hybrids for tortilla production: Significance of corn physico-chemical characteristics and process conditions. *Cereal Chem.* 78(2):116–120.
- Sahai, D. and Jackson, D.S. 2001. A novel enzymatic nixtamalization process for producing corn masa flour. *Cereal Foods World:* 46:240-246.
- Shandera Jr., D.L. and Jackson, D.S. 2002. Corn Kernel Structural Integrity: Analysis Using Solvent and Heat Treatments. *Cereal Chem.* 79(2):308-316.
- Pineda-Valdes, G, Ryu, D., Jackson, D.S. and Bullerman, L.B. 2002. Reduction of Moniliformin During Alkaline Cooking of Corn. *Cereal Chem.* 79(6):779-782.
- Ozcan, S. and Jackson, D.S. 2002 The Impact of Thermal Events on Amylose-Fatty Acid Complexes. *Starch/Stärke* 54(12): 593-602.
- Ozcan, S. and Jackson, D.S. 2003. A response surface analysis of commercial corn starch annealing. *Cereal Chem.* 80(2): 241-243.
- Guo, G., Jackson, D.S., Graybosch, R.A. and Parkhurst, A.M. 2003. Asian salted noodle quality: Impact of amylose content adjustments using waxy wheat flour. *Cereal Chem.* 80(4):437-445.
- Guo, G., Jackson, D.S., Graybosch, R.A. and Parkhurst, A.M. 2003. Wheat tortilla quality: Impact of amylose content adjustments using waxy wheat flour. *Cereal Chem.* 80(4):427-436.
- Guo, G., Shelton, D.R., Jackson, D.S. and Parkhurst, A.M.. 2004. Comparison study of laboratory and pilot plant methods for Asian salted noodle processing. *J of Food Sci.* 69(4):Fep159-Fep163.
- Lee, K.-M., Herrman, T.J., Lingenfelter, J. and Jackson, D.S. 2005. Classification and prediction of maize hardness-associated properties using multivariate statistical analyses. *J of Cereal Sci.* 41(1):85-93.
- Ozcan, S. and Jackson, D.S. 2005. Functionality Behavior of Raw and Extruded Corn Starch Mixtures. *Cereal Chem.* 82(2): 223-227.
- Duarte, A.P., Mason, S.C., Jackson, D.S. and Kiehl, J. de C. 2005. Grain Quality of Brazilian Maize Genotypes as Influenced by Nitrogen Level. *Crop Sci.* 45(5):1958-1964. ([Abstract](#))
- Yglesias, R. and Jackson, D.S. 2005. Evaluation of liquid nitrogen freeze drying and ethanol dehydration as methods to preserve partially cooked starch and masa systems. *Cereal Chem.* 82(6):702-705. ([Abstract](#))

Yglesias, R., Parkhurst, A.M. and Jackson, D.S. 2005. Development of laboratory techniques to mimic industrial scale nixtamalization. *Cereal Chem.* 82(6):695-701. ([Abstract](#))

Jaeger, S.L., Luebbe, M.K., Macken, C.N., Erickson, G.E., Klopfenstein, T.J., Fithian, W.A. and Jackson, D.S. 2006. Influence of corn hybrid traits on digestibility and the efficiency of gain in feedlot cattle. *J. Anim Sci.* 84(7):1790-1800. ([Abstract](#))

Ratnayake, W. and Jackson, D.S. 2006. Gelatinization and Solubility of Corn Starch during Heating in Excess Water: New Insights. *J. Agric. Food Chem.* 54(10): 3712–3716. ([Abstract](#))

Ratnayake, W.S. and Jackson, D.S. 2007. A new insight into the gelatinization process of native starches. *Carbohydrate Polymers* 67:511–529. ([Abstract](#))

Kaye, N.M., Mason, S.C., Jackson, D.S. and Galusha, T.D. 2007. Crop rotation and soil amendment alters sorghum grain quality. *Crop Science*: 47:722-727. ([Abstract](#))

Lee, K.-M., Herrman, T.J., Bean, S.R., Jackson, D. S. and Lingenfelter, J. 2007. Classification of Dry-Milled Maize Grit Yield Groups using Quadratic Discriminant Analysis and Decision Tree Algorithm. *Cereal Chemistry* 84(2):152–161. ([Abstract](#))

Ratnayake, W. S, Wassinger, A.B., and Jackson, D.S. 2007. Extraction and characterization of starch from alkaline cooked corn masa. *Cereal Chemistry* 84(4):414-420. ([Abstract](#))

Lee, K-M. Lee, Herrman, T.J., Rooney, L., Jackson, D.S., Lingenfelter, J., Rausch, K.D., McKinney, J., Iiams, C., Byrum, L. Hurburgh, C.R. Jr., Johnson, L.A. and Fox, S.R. 2007. Corroborative Study on Maize Quality, Dry-Milling and Wet-Milling Properties of Selected Maize Hybrids. *J. Agric. Food Chem.* 55 (26):10751-10763. ([Abstract](#))

Zhu, T., Jackson, D.S., Wehling, R.L. and Gera, B. 2008. Comparison of Amylose Determination Methods and the Development of a Dual Wavelength Iodine Binding Technique. *Cereal Chemistry* 85(1):51-58. ([Abstract](#))

Ratnayake, W.S, and Jackson, D.S. 2008. Phase Transition of Cross-Linked and Hydroxypropylated Corn (*Zea mays* L.) Starches. *LWT Food Science & Technology* 41(2):346-358. ([Abstract](#))

Ratnayake, W.S, and Jackson, D.S. 2008. Thermal Behavior of Resistant Starches RS 2, RS 3, and RS 4. *Journal of Food Science*: In press. ([Abstract](#))

### *Book Chapters*

Jackson, D.S. and Shandera Jr., D.L., 1995. Corn Wet Milling: Separation Chemistry and Technology. In: *Advances in Food and Nutrition Research*, J.E. Kinsella and S.L. Taylor, eds. Academic Press, San Diego, CA USA. Volume 38, Pages 271-300.

Jackson, D.S. 1993/2003. Starch: Functional Properties. In: *Encyclopaedia of Food Science, Food Technology and Nutrition* (1993), *Encyclopedia of Food Sciences and Nutrition* (2003). R. Macrae, R. Robinson, and M. Sadler, eds. Academic Press Limited, London. ([Revised Edition, 2003:5572-5575.](#))

Jackson, D.S. 1993/2003. Starch: Structure, chemical properties and analysis. In: *Encyclopaedia of Food Science, Food Technology and Nutrition* (1993), *Encyclopedia of Food Sciences and Nutrition* (2003), R. Macrae, R. Robinson, and M. Sadler, eds. Academic Press Limited, London. ([Revised Edition, 2003: 5561-5567.](#))

Ratnayake, W.S. and Jackson, D.S. 2003. Starch: Sources and Processing. In: *Encyclopedia of Food Sciences and Nutrition*, [Revised 2nd Edition: 5567-5572.](#)

Ratnayake, W.S. and Jackson, D.S. 2008. Starch Gelatinization. In: *Advances in Food and Nutrition Research*, Volume S.L. Taylor, ed. Elsevier, Inc. (Academic Press). Volume 55, In press.

## Extension & Multi-Media Publications

### *(7 Extension & Multi-Media Publications 1992-1999, Not Listed)*

Jackson, D.S. and Hegenbart, S. 2000. Corn's A-Maize-Ing Feats. Video. (Greg Cichy, Producer). University of Nebraska-Lincoln.

Jackson, D.S. 2000, 2001, 2002, 2003, 2004. Nebraska Food Grade Corn Study. In: 2000-2001 (and subsequent years) Nebraska Corn Quality Report. Nebraska Corn Development Utilization and Marketing Board.

Jackson, D.S. 2003. Tortilla Processing. Online Video. <http://grainquality.unl.edu/>.

Jackson, D.S. 2003. Nixtamalization. Online Educational Animation. <http://grainquality.unl.edu/>

Jaeger, S.L., Macken, C.N., Erickson, G.E., Klopfenstein, T.J., Fithian, W.A. and Jackson, D.S., (2004, 04/21). The Influence of Corn Kernel Traits on Feedlot Cattle Performance. In: 2004 Beef Cattle Reports. p. 54-57, University of Nebraska, Dept. of Animal Science. ([Abstract](#))

Harrelson, F.W., Erickson, G.E., Klopfenstein, T.J., Nelson, L.A. and Jackson, D.S. 2005. Influence of Corn Hybrid on Kernel Traits. In: 2006 Beef Cattle Reports. p. 43-44, University of Nebraska, Dept. of Animal Science. ([Abstract](#))

Harrelson, F.W., Erickson, G.E., Klopfenstein, T.J., Fithian, W.A., Clark, P.M. and Jackson, D.S. 2005. Influence of Corn Hybrid, Kernel Traits, and Dry Rolling or Steam Flaking on Digestibility. In: 2006 Beef Cattle Reports. p. 45-47, University of Nebraska, Dept. of Animal Science. ([Abstract](#))

Harrelson, F.W., Erickson, G.E., Klopfenstein, T.J., Jackson, D.S. and Fithian, W.A. 2007. Influence of Corn Hybrid, Kernel Traits, and Growing Location on Digestibility. In: 2008 Beef Cattle Reports. p. 45-47, University of Nebraska, Dept. of Animal Science. ([Abstract](#))

### *Special Reports*

Jackson, D.S., Sahai, D., Surjawan, I., Buendia-Gonzalez, M.O., Rowe, M.J. and Mua, J-P. Traditional Alkaline Cooking and Tortilla Production: Final Report to CONASUPO (Mexican Government). November 1998. 177 pages.

### *Patents*

Jackson, D.S. and Sahai, D. 2002. Enzymatic process for nixtamalization of cereal grains. US Patent No. 6,428,828. August 6, 2002.