

**Career Vitae**  
**DR. PAUL M. VANRADEN**



**Present Position** Research Geneticist (Animal)  
Animal Genomics and Improvement Laboratory,  
Agricultural Research Service, USDA

**Present Address** USDA, ARS, Animal Genomics and Improvement Laboratory  
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**Citizenship** United States (born May 11, 1960, in Freeport, IL)

**Education** University of Illinois, B.S., dairy science, 1981  
Iowa State University, M.S., animal breeding, 1984  
Iowa State University, Ph.D., animal breeding, 1986

**Employment** Graduate research assistant, Iowa State University, Ames, IA, 1982–86  
Postdoctoral research associate, Iowa State University, Ames, IA, 1986  
Postdoctoral research associate, University of Wisconsin, Madison, WI, 1987–88  
Research geneticist (animal), Animal Genomics and Improvement Laboratory (formerly Animal Improvement Programs Laboratory), ARS, USDA, Beltsville, MD, 1988–present

**Societies** Alpha Zeta (agricultural honorary society)  
American Dairy Science Association  
Federation of Animal Science Societies  
Gamma Sigma Delta (agricultural honorary society)  
Phi Kappa Phi (scholastic honorary society)

**Honors Individual Awards** American Dairy Science Association  
J.L. Lush Award in Animal Breeding, 2000  
*Journal of Dairy Science* featured article of the month (3 senior authorships, 7 coauthorships), 2013–16, 2019  
Most Cited Award, *Journal of Dairy Science*, Genetics and Breeding, 2011–12, 2016  
Northeast ADSA/ASAS Young Scientist Award, 1997  
Richard M. Hoyt Award (best doctoral research), 1986  
Zinpro Award for Excellence in Dairy Science, 2019  
American Registry of Professional Animal Scientists, Washington, DC, Chapter, Dr. Vernon G. Pursel Memorial Distinguished Service Award, 2018  
Clarivate Analytics Highly Cited Researcher Award (Agricultural Sciences), 2014–19  
Dairy Shrine Award for Undergraduate Achievement, 1981  
Future Farmers of America's State Farmer degree, 1978  
Iowa State University  
Holco Research Excellence Award in Animal Science, 1985  
T.A. Bancroft Award (statistics), 1986  
National Association of Animal Breeders Research Award, 2002

## Career Vitae, DR. PAUL M. VANRADEN (2)

### Honors

University of Illinois

#### *Individual*

Bronze Tablet Award (top 3% for academic achievement, College of Agriculture), 1981

#### *Awards (cont.)*

Department of Dairy Science's Leo Fryman Leadership Award, 1981

USDA

Agricultural Research Service

Early Career Scientist of the Year, 1995

Science Hall of Fame inductee, 2020

Spot award for overseeing development and implementation of all-breed animal model for genetic evaluation of US dairy cattle, 2007

### *Group Awards*

Agriculture, Food, Nutrition, and Natural Resources R&D Round Table Exemplary Case

Selected for Special Recognition (team member), 2011

Binational Agricultural Research and Development Fund recognition of research excellence (team member), 2020

Council on Dairy Cattle Breeding Award of Recognition (team member), 2015

Federal Laboratory Consortium for Technology Transfer Citation (team member), 2000

Government Executive magazine Government Technology Leadership Award (team member), 1998

Holstein World magazine "Web Site of the Month" Award, 1998

IBM 3090 Supercomputing Competition (3rd place paper coauthor), 1990

National Dairy Herd Improvement Association Award of Special Appreciation (team member), 1991

National Partnership for Reinventing Government (Vice-Presidential Hammer) Award (team leader), 2000

USDA

Agricultural Research Service Superior Effort Technology Transfer Award (team member), 2000

Beltsville Agricultural Research Center Public Field Day exhibit competition (3rd place), 2000

Secretary's Honor Award (team member), 2010

Unit Award for Distinguished Service, 1991

### *USDA Grants*

Agriculture and Food Research Initiative, "Single-Step National Evaluation Using

Phenotypic, Full Pedigree, and Genomic Information," co-investigator, \$388,343, 2009–12

Binational Agricultural Research and Development Fund, "A Systematic Genome Search for Genes Affecting Economic Traits in Dairy Cattle," \$33,000, 1996–99

### *Activities*

4th World Congress on Genetics Applied to Livestock Production (invited speaker), Edinburgh, UK, 1990

"Advancing Dairy Cattle Genetics: Genomics and Beyond" Workshop (invited speaker), Tempe, AZ, 2014

American Dairy Science Association

3rd Discover Conference (invited speaker), 1999

Annual meetings

Breeding and Genetics Program Committee, 2019–present

Invited speaker, 1991, 2000–01, 2008–09, 2011, 2015, 2019

Dairy Cattle Improvement Committee (member), 1991–95

Journal of Dairy Science (reviewer), 1987–present

American Jersey Cattle Association Board of Directors (resource person), 2015

American Registry of Professional Animal Scientists, DC Chapter (invited speaker), 2017

"Animals & Bioengineering: A Consideration of Law, Ethics and Science" Conference (invited speaker), Durham, NC, 2007

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#### Activities (cont.)

Australian Dairy Herd Improvement Conference (invited speaker, 2 presentations), Bendigo, Australia, 2015  
Beef Improvement Federation annual meeting (invited speaker), 2005  
Canadian Dairy Industry Forum (invited speaker), Belleville, ON, Canada, 2008  
Council on Dairy Cattle Breeding  
    Biannual meeting research reports, 2006–present  
    Genetic Evaluation Methods Committee (resource person), 2017–present  
    Industry meeting (invited speaker), Madison, WI, 2015–present; Reno, NV, 2019  
    USDA liaison, 2016–present  
Dairy Cattle Fertility: Health, Management, and Genetics” Symposium (invited speaker), Cremona, Italy, 2005  
European Federation of Animal Science (invited speaker), Barcelona, Spain, 2009; Tallinn, Estonia (joint session with Interbull), 2017  
Gordon Research Conference on Quantitative Genetics (invited speaker), Galveston, TX, 2009  
Holstein Association USA  
    Genetic Advancement Committee (resource person), 1988–89, 1992–93, 1996–97, 1991, 2001, 2005–06, 2013–15, 2017  
    Genetic evaluation software for conformation traits, 1988  
*Holstein International* (interview), 2017  
International Bull Evaluation Service (Interbull)  
    Brown Swiss Technical Committee (member), 2010–11  
    Genomic Reliabilities Working Group (member), 2015–present  
    Genomics Task Force (member), 2008–10  
    Genomics Workshop (invited speaker), 2009–10; (discussion group leader), 2011  
    Steering Committee (US representative), 2006–09  
    Technical Committee (invited speaker), 2004, 2010; (member), 2009–present  
    Technical Workshop (invited speaker), 2012  
    Validation Working Group (member), 2019–present  
International Committee on Animal Recording  
    Annual meeting (invited speaker), 2014  
    Parentage Working Group (member), 2012  
    Working Group on Lactation Record Calculation (member), 2001–08  
LaTrobe University (Australia), Ph.D. thesis outside examiner, 2016  
Multi-State Research Projects  
    NC-2 “Improving Dairy Cattle Genetically” (member), 1982–91  
    NC-209 “Genetic Improvement of Dairy Cattle Using Molecular Markers” (member), 1992–96  
    S-284 “Genetic Enhancement of Health & Survival for Dairy Cattle” (chair), 1996–97  
    S-1008/1040 “Genetic Selection and Crossbreeding to Enhance Reproduction and Survival for Dairy Cattle” (member), 2002–07  
    SCC-084, “Genetic Selection and Mating Strategies to Improve the Well-Being and Efficiency of Dairy Cattle” (resource person), 2016–17, 2019  
National Association of Animal Breeders  
    Dairy Sire Evaluation Committee (resource person), 1988–present  
    International Dairy Press Tours (resource person), 1990–2002  
    International Marketing Committee (resource person), 1988–present  
    Sire Analysts Conference (invited speaker), 1989, 1990, 1992, 1996  
National Dairy Genetics Workshop (invited speaker), 1995, 2003  
National DHIA annual meeting (invited speaker), 2003, 2008  
National Electronic Identification Board (consultant), 1989  
National Mastitis Council’s Genetics and Mastitis Task Force, 1992–94  
National Swine Improvement Federation annual meeting (invited speaker), 2008

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### Activities (cont.)

“New Techniques for Production and Reproduction in Cattle” Conference (invited speaker), Uberlandia, Brazil, 2007  
Plant and Animal Genome Conference XXIV (invited speaker), San Diego, CA, 2016  
“Potential Improvements in Animal Model Evaluation Systems” seminar (invited speaker), Stuttgart, Germany, 1991  
Select Sires (resource person), 2012, 2016  
University of Florida, Phenotypic Prediction Workshop (invited speaker), Gainesville, FL, 2016  
University of Maryland  
Ph.D. advisor, 2016–18  
Topics in Biometrics: Computational and Statistical Genomics (invited speaker), 2013, 2016  
USDA  
Agricultural Research Service  
Beltsville Area’s Biometrics Advisory Committee (member), 2002–05  
Beltsville Symposium XX, “Biotechnology’s Role in the Genetic Improvement of Farm Animals” (invited speaker), 1995  
Binational Agricultural Research and Development project “A Systematic Genome Search for Genes Affecting Economic Traits in Dairy Cattle” (co-principal investigator), 1996–99  
“Celebrate the Past and Discuss the Future,” centennial celebration of the Animal Improvement Programs Laboratory (invited speaker), 2008  
Research Performance Evaluation System (panelist), 2004–present  
Cooperative State Research, Education, and Extension Service  
Agriculture and Food Research Initiative project “Single-Step National Evaluation Using Phenotypic, Full Pedigree, and Genomic Information” (co-principal investigator), 2009–12  
National Research Initiative (grant reviewer), 1992  
WCC-100 Beef Cattle Breeding Group annual meeting (invited speaker), 1996  
W.E. Petersen Symposium (invited speaker), St. Paul, MN, 2007

### Peer-Reviewed Scientific Publications

**VanRaden, P.M.**, Freeman, A.E., and Rothschild, M.F. Maximizing genetic gain under multiple-stage selection. *J. Dairy Sci.* 67:1761–1766. 1984.

**VanRaden, P.M.**, and Freeman, A.E. Potential genetic gains from producing bulls with only sires as parents. *J. Dairy Sci.* 68:1425–1431. 1985.

**VanRaden, P.M.**, and Freeman, A.E. Rapid method to obtain bounds on accuracies and prediction error variances in mixed models. *J. Dairy Sci.* 68:2123–2133. 1985.

**VanRaden, P.M.**, and Jung, Y.C. A general-purpose approximation to REML: The tilde-hat approach. *J. Dairy Sci.* 71:187–194. 1988.

**VanRaden, P.M.**, Jensen, E.L., Lawlor, T.J., and Funk, D.A. Prediction of transmitting abilities for Holstein type traits. *J. Dairy Sci.* 73:191–197. 1990.

Wiggans, G.R., and **VanRaden, P.M.** Animal model evaluation within herd linked to national evaluations. *J. Dairy Sci.* 73:1956–1963. 1990.

Wiggans, G.R., and **VanRaden, P.M.** Including information from records in later herds in animal model evaluations. *J. Dairy Sci.* 73:3336–3339. 1990.

**Peer-Reviewed Scientific Publications (cont.)**

Hoeschele, I., and **VanRaden, P.M.** Rapid inversion of dominance relationship matrices for noninbred populations by including sire by dam subclass effects. *J. Dairy Sci.* 74:557–569. 1991.

**VanRaden, P.M.**, and Hoeschele, I. Rapid inversion of additive by additive relationship matrices by including sire-dam combination effects. *J. Dairy Sci.* 74:570–579. 1991.

**VanRaden, P.M.**, and Wiggans, G.R. Derivation, calculation, and use of national animal model information. *J. Dairy Sci.* 74:2737–2746. 1991.

**VanRaden, P.M.**, Wiggans, G.R., and Ernst, C.A. Expansion of projected lactation yield to stabilize genetic variance. *J. Dairy Sci.* 74:4344–4349. 1991.

Wiggans, G.R., and **VanRaden, P.M.** Method and effect of adjustment for heterogeneous variance. *J. Dairy Sci.* 74:4350–4357. 1991.

Misztal, I., Lawlor, T.J., Short, T.H., and **VanRaden, P.M.** Multiple-trait estimation of variance components of yield and type traits using an animal model. *J. Dairy Sci.* 75:544–551. 1992.

Boettcher, P.J., Hansen, L.B., **VanRaden, P.M.**, and Ernst, C.A. Genetic evaluation of Holstein bulls for somatic cells in milk of daughters. *J. Dairy Sci.* 75:1127–1137. 1992.

Wiggans, G.R., **VanRaden, P.M.**, and Powell, R.L. A method for combining United States and Canadian bull evaluations. *J. Dairy Sci.* 75:2834–2839. 1992.

**VanRaden, P.M.**, Lawlor, T.J., Short, T.H., and Hoeschele, I. Use of reproductive technology to estimate variances and predict effects of gene interactions. *J. Dairy Sci.* 75:2892–2901. 1992.

**VanRaden, P.M.** Accounting for inbreeding and crossbreeding in genetic evaluation of large populations. *J. Dairy Sci.* 75:3136–3144. 1992.

Schutz, M.M., **VanRaden, P.M.**, Boettcher, P.J., and Hansen, L.B. Relationship of somatic cell score and linear type trait evaluations of Holstein sires. *J. Dairy Sci.* 76:658–663. 1993.

Hoeschele, I., and **VanRaden, P.M.** Bayesian analysis of linkage between genetic markers and quantitative trait loci. II. Combining prior knowledge with experimental evidence. *Theor. Appl. Genet.* 85:946–952. 1993.

Hoeschele, I., and **VanRaden, P.M.** Bayesian analysis of linkage between genetic markers and quantitative trait loci. I. Prior knowledge. *Theor. Appl. Genet.* 85:953–960. 1993.

**VanRaden, P.M.**, and Klaaskate, E.J.H. Genetic evaluation of length of productive life including predicted longevity of live cows. *J. Dairy Sci.* 76:2758–2764. 1993.

Schutz, M.M., **VanRaden, P.M.**, and Wiggans, G.R. Genetic variation in lactation means of somatic cell scores for six breeds of dairy cattle. *J. Dairy Sci.* 77:284–293. 1994.

Powell, R.L., Wiggans, G.R., and **VanRaden, P.M.** Factors affecting calculation and use of conversion equations for genetic merit of dairy bulls. *J. Dairy Sci.* 77:2679–2686. 1994.

**Peer-Reviewed Scientific Publications (cont.)**

**VanRaden, P.M.**, and Wiggans, G.R. Productive life evaluations: Calculation, accuracy, and economic value. *J. Dairy Sci.* 78:631–638. 1995.

Wiggans, G.R., **VanRaden, P.M.**, and Zuurbier, J. Calculation and use of inbreeding coefficients for genetic evaluation of United States dairy cattle. *J. Dairy Sci.* 78:1584–1590. 1995.

Schutz, M.M., **VanRaden, P.M.**, Wiggans, G.R., and Norman, H.D. Standardization of lactation means of somatic cell scores for calculation of genetic evaluations. *J. Dairy Sci.* 78:1843–1854. 1995.

Weller, J.I., Wiggans, G.R., **VanRaden, P.M.**, and Ron, M. Application of a canonical transformation to detection of quantitative trait loci with the aid of genetic markers in a multi-trait experiment. *Theor. Appl. Genet.* 92:998–1002. 1996.

Powell, R.L., and **VanRaden, P.M.** Examination of international genetic evaluations of Holstein bulls. *J. Dairy Sci.* 79:1659–1665. 1996.

Lee, J.K., **VanRaden, P.M.**, Norman, H.D., Wiggans, G.R., and Meinert, T.R. Relationship of yield during early lactation and days open during current lactation with 305-day yield. *J. Dairy Sci.* 80:771–776. 1997.

Powell, R.L., **VanRaden, P.M.**, and Wiggans, G.R. Relationship between United States and Canadian genetic evaluations of longevity and somatic cell score. *J. Dairy Sci.* 80:1807–1812. 1997.

Ashwell, M.S., Rexroad Jr., C.E., Miller, R.H., **VanRaden, P.M.**, and Da, Y. Detection of loci affecting milk production and health traits in an elite US Holstein population using microsatellite markers. *Anim. Genet.* 28:216–222. 1997.

**VanRaden, P.M.** Lactation yields and accuracies computed from test day yields and (co)variances by best prediction. *J. Dairy Sci.* 80:3015–3022. 1997.

Weigel, K.A., Lawlor Jr., T.J., **VanRaden, P.M.**, and Wiggans, G.R. Use of linear type and production data to supplement early predicted transmitting abilities for productive life. *J. Dairy Sci.* 81:2040–2044. 1998.

Ashwell, M.S., Da, Y., **VanRaden, P.M.**, Rexroad Jr., C.E., and Miller, R.H. Detection of putative loci affecting conformational type traits in an elite population of United States Holsteins using microsatellite markers. *J. Dairy Sci.* 81:1120–1125. 1998.

Ashwell, M.S., Da, Y., Van Tassell, **VanRaden, P.M.**, Miller, R.H., and Rexroad Jr., C.E. Detection of putative loci affecting milk production and composition, health, and type traits in a United States Holstein population. *J. Dairy Sci.* 81:3309–3314. 1998.

Da, Y., **VanRaden, P.M.**, Beattie, C.W., Wu, C., and Schook, L.B. Designs of reference families for the construction of genetic linkage maps. *Anim. Biotech.* 9:205–225. 1998.

Norman, H.D., **VanRaden, P.M.**, Wright, J.R., and Clay, J.S. Comparison of test interval and best prediction methods for estimation of lactation yield from monthly, a.m.-p.m., and trimonthly testing. *J. Dairy Sci.* 82:438–444. 1999.

**Peer-Reviewed Scientific Publications (cont.)**

Norman, H.D., **VanRaden, P.M.**, Wright, J.R., and L.A. Smith. Mathematical representations of correlations among yield traits and somatic cell score on test day. *J. Dairy Sci.* 82:2205–2211. 1999.

Da, Y., **VanRaden, P.M.**, Ron, M., Beever, J.E., Paszek, A.A., Song, J., Wiggans, G.R., Ma, R., Weller, J.I., and Lewin, H.A. Standardization and conversion of marker polymorphism measures. *Anim. Biotech.* 10:25–35. 1999.

Heyen, D.W., Weller, J.I., Ron, M., Band, M., Beever, J.E., Feldmesser, E., Da, Y., Wiggans, G.R., **VanRaden, P.M.**, and Lewin, P.M. A genome scan for QTL influencing milk production and health traits in dairy cattle. *Physiol. Genomics* 1:165–175. 1999.

**VanRaden, P.M.**, and Smith, L.A. Selection and mating considering expected inbreeding of future progeny. *J. Dairy Sci.* 82:2771–2778. 1999.

Da, Y., **VanRaden, P.M.**, and Schook, L.B. Detection and parameter estimation for quantitative trait loci using regression models and multiple markers. *Genet. Sel. Evol.* 32:357–381. 2000.

Boettcher, P.J., Jairath, L.K., and **VanRaden, P.M.** Evaluation of sire predicted transmitting abilities for evidence of x-chromosomal inheritance in North American sire families. *J. Dairy Sci.* 84:256–265. 2001.

**VanRaden, P.M.** Methods to combine estimated breeding values obtained from separate sources. *J. Dairy Sci.* (E. Suppl.):E47–E55. 2001.

Wiggans, G.R., **VanRaden, P.M.**, Bormann, J., Philpot, J.C., Druet, T., and Gengler, N. Deriving lactation yields from test-day yields adjusted for lactation stage, age, pregnancy, and herd test date. *J. Dairy Sci.* 85:264.e1–264.e11. 2002.

Powell, R.L., and **VanRaden, P.M.** International dairy bull evaluations expressed on national, subglobal, and global scales. *J. Dairy Sci.* 85:1863–1868. 2002.

**VanRaden, P.M.**, and Sanders, A.H. Economic merit of crossbred and purebred US dairy cattle. *J. Dairy Sci.* 86:1036–1044. 2003.

Wiggans, G.R., **VanRaden, P.M.**, and Philpot, J.C. Detection and adjustment of abnormal test-day yields. *J. Dairy Sci.* 86:2721–2724. 2003.

Ashwell, M.S., Heyen, D.W., Sonstegard, T.S., Van Tassell, C.P., Da, Y., **VanRaden, P.M.**, Ron, M., Weller, J.I., and Lewin, H.A. Detection of quantitative trait loci affecting milk production, health, and reproductive traits in Holstein cattle. *J. Dairy Sci.* 87:468–472. 2004.

Kuhn, M.T., **VanRaden, P.M.**, and Hutchison, J.L. Use of early lactation days open records for genetic evaluation of cow fertility. *J. Dairy Sci.* 87:2277–2284. 2004.

**VanRaden, P.M.**, Sanders, A.H., Tooker, M.E., Miller, R.H., Norman, H.D., Kuhn, M.T., and Wiggans, G.R. Development of a national genetic evaluation for cow fertility. *J. Dairy Sci.* 87:2285–2292. 2004.

**VanRaden, P.M.** Invited review: Selection on net merit to improve lifetime profit. *J. Dairy Sci.* 87:3125–3131. 2004.



**Peer-Reviewed Scientific Publications (cont.)**

Dechow, C.D., Rogers, G.W., Klei, L., Lawlor, T.J., and **VanRaden, P.M.** Body condition scores and dairy form evaluations as indicators of days open in US Holsteins. *J. Dairy Sci.* 87:3534–3541. 2004.

Norman, H.D., **VanRaden, P.M.**, Powell, R.L., Wright, J.R., and VerBoort, W.R. Effectiveness of national and regional sire evaluations in predicting future-daughter milk yield. *J. Dairy Sci.* 88:812–826. 2005.

Cole, J.B., Goodling Jr., R.C., Wiggans, G.R., and **VanRaden, P.M.** Genetic evaluation of calving ease for Brown Swiss, Jersey, and Holstein bulls from purebred and crossbred calvings. *J. Dairy Sci.* 88:1529–1539. 2005.

Norman, H.D., Wright, J.R., Powell, R.L., and **VanRaden, P.M.** Impact of maturity rate of daughters on genetic ranking of Holstein bulls. *J. Dairy Sci.* 88:3337–3345. 2005.

**VanRaden, P.M.**, and Miller, R.H. Effects of nonadditive genetic interactions, inbreeding, and recessive defects on embryo and fetal loss by seventy days. *J. Dairy Sci.* 89:2716–2721. 2006.

Cole, J.B., and **VanRaden, P.M.** Genetic evaluation and best prediction of lactation persistency. *J. Dairy Sci.* 89:2722–2728. 2006.

**VanRaden, P.M.**, Dematawewa, C.M.B., Pearson, R.E., and Tooker, M.E. Productive life including all lactations and longer lactations with diminishing credits. *J. Dairy Sci.* 89:3123–3220. 2006.

**VanRaden, P.M.**, Tooker, M.E., Cole, J.B., Wiggans, G.R., and Magonigal Jr., J.H. Genetic evaluations for mixed-breed populations. *J. Dairy Sci.* 90:2434–2441. 2007.

Cole, J.B., Wiggans, G.R., and **VanRaden, P.M.** Genetic evaluation of stillbirth in United States Holsteins using a sire-maternal grandsire threshold model. *J. Dairy Sci.* 90:2480–2488. 2007.

Cole, J.B., Wiggans, G.R., **VanRaden, P.M.**, and Miller, R.H. Stillbirth (co)variance components for a sire-maternal grandsire threshold model and development of a calving ability index for sire selection. *J. Dairy Sci.* 90:2489–2496. 2007.

Dematawewa, C.M.B., Pearson, R.E., and **VanRaden, P.M.** Modeling extended lactations of Holsteins. *J. Dairy Sci.* 90:3924–3936. 2007.

Norman, H.D., Wright, J.R., Powell, R.L., **VanRaden, P.M.**, Miglior, F., and de Jong, G. Consistency of maturity rate for milk yield across countries. *J. Dairy Sci.* 90:3937–3944. 2007.

Mark, T., Fikse, W.F., Sullivan, P.G., and **VanRaden, P.M.** Prediction of genetic correlations and international breeding values for missing traits. *J. Dairy Sci.* 90:4805–4813. 2007.

**VanRaden, P.M.** Efficient methods to compute genomic predictions. *J. Dairy Sci.* 91:4414–4423. 2008.

**VanRaden, P.M.**, Van Tassell, C.P., Wiggans, G.R., Sonstegard, T.S., Schnabel, R.D., Taylor, J.F., and Schenkel, F.S. Invited review: Reliability of genomic predictions for North American Holstein bulls. *J. Dairy Sci.* 92:16–24. 2009.

Cole, J.B., Null, D.J., and **VanRaden, P.M.** Best prediction of yields for long lactations. *J. Dairy Sci.* 92:1796–1810. 2009.



**Peer-Reviewed Scientific Publications (cont.)**

Norman, H.D., Wright, J.R., Kuhn, M.T., Hubbard, S.M., Cole, J.B., and **VanRaden, P.M.** Genetic and environmental factors that affect gestation length in dairy cattle. *J. Dairy Sci.* 92:2259–2269. 2009.

Cole, J.B., **VanRaden, P.M.**, O'Connell, J.R., Van Tassell, C.P., Sonstegard, T.S., Schnabel, R.D., Taylor, J.F., and Wiggans, G.R. Distribution and location of genetic effects for dairy traits. *J. Dairy Sci.* 92:2931–2946. 2009.

Wiggans, G.R., Sonstegard, T.S., **VanRaden, P.M.**, Matukumalli, L.K., Schnabel, R.D., Taylor, J.F., Schenkel, F.S., and Van Tassell, C.P. Selection of single-nucleotide polymorphisms and quality of genotypes used in genomic evaluation of dairy cattle in the United States and Canada. *J. Dairy Sci.* 92:3431–3436. 2009.

**VanRaden, P.M.**, and Sullivan, P. International genomic evaluation methods for dairy cattle. *Genet. Sel. Evol.* 42:7. 2010.

Weigel, K.A., Van Tassell, C.P., O'Connell, J.R., **VanRaden, P.M.**, and Wiggans, G.R. Prediction of unobserved single nucleotide polymorphism genotypes of Jersey cattle using reference panels and population-based imputation algorithms. *J. Dairy Sci.* 93:2229–2238. 2010.

Wiggans, G.R., **VanRaden, P.M.**, Bacheller, L.R., Tooker, M.E., Hutchison, J.L., Cooper, T.A., and Sonstegard, T.S. Selection and management of DNA markers for use in genomic evaluation. *J. Dairy Sci.* 93:2287–2292. 2010.

Cole, J.B., and **VanRaden, P.M.** Visualization of results from genomic evaluations. *J. Dairy Sci.* 93:2727–2740. 2010.

**VanRaden, P.M.**, O'Connell, J.R., Wiggans, G.R., and Weigel, K.A. Genomic evaluations with many more genotypes. *Genet. Sel. Evol.* 43:10. 2011.

Cole, J.B., and **VanRaden, P.M.** Use of haplotypes to estimate Mendelian sampling effects and selection limits. *J. Anim. Breed. Genet.* 128:448–445. 2011.

Olson, K.M., **VanRaden, P.M.**, Tooker, M.E., and Cooper, T.A. Differences among methods to validate genomic evaluations for dairy cattle. *J. Dairy Sci.* 94:2613–2620. 2011.

Wiggans, G.R., **VanRaden, P.M.**, and Cooper, T.A. The genomic evaluation system in the United States: Past, present, future. *J. Dairy Sci.* 94:3202–3211. 2011.

**VanRaden, P.M.**, Olson, K.M., Wiggans, G.R., Cole, J.B., and Tooker, M.E. Genomic inbreeding and relationships among Holsteins, Jerseys, and Brown Swiss. *J. Dairy Sci.* 94:5673–5682. 2011.

Norman, H.D., Hutchison, J.L., and **VanRaden, P.M.** Evaluations for service-sire conception rate for heifer and cow inseminations with conventional and sexed semen. *J. Dairy Sci.* 94:6135–6142. 2011.

**VanRaden, P.M.**, Olson, K.M., Null, D.J., and Hutchison, J.L. Harmful recessive effects on fertility detected by absence of homozygous haplotypes. *J. Dairy Sci.* 94:6153–6161. 2011.

Wiggans, G.R., Cooper, T.A., **VanRaden, P.M.**, and Cole, J.B. Technical note: Adjustment of traditional cow evaluations to improve accuracy of genomic predictions. *J. Dairy Sci.* 94:6188–6193. 2011.

**Peer-Reviewed Scientific Publications (cont.)**

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