Breeding and Genetics: International Evaluation of Dairy Bulls—In Honor of Dr. Rex Powell

Dr. Powell’s contribution to international comparison of dairy bulls. F. Miglior*1,2, 1Agriculture and Agri-Food Canada - Dairy and Swine Research and Development Centre, Lennoxville, QC, 2Canadian Dairy Network, Guelph, ON, Canada.

Dr. Powell wrote his first article on conversion equations between Canada and US in a popular press magazine in 1979, several years before Interbull was created and preliminary methodology of international comparison were developed. In that article he concluded that the international scientific community needed to provide guidance to users of sire evaluations across national borders, though derived equations were not as near perfect as would be desired. Four years later Interbull was created and Dr. Powell has been a member of the Interbull Steering Committee in 18 of the last 21 years. Dr. Powell is an international leader in collaborative efforts to coordinate genetic evaluations of dairy cattle and to enhance genetic improvement on a global basis. Apart from his strong contribution to the improvement of national genetic evaluations in US, Dr. Powell has worked extensively to develop genetic evaluations in several countries. Dr. Powell conducted the most extensive comparison of methods for converting genetic evaluations of dairy bulls among countries. His most relevant findings were: a) importance of correct definition of genetic groups; b) impact of different criteria for data editing and inclusion in international evaluations; and c) presence of bias when imported data were included in evaluations. Once Interbull MACE evaluations became available in 1995, Dr. Powell carried out many projects that have helped to increase the accuracy of international bull evaluations. Recently his focus has been on outlining the impact of genetic correlations among countries on accuracy of sire rankings. His findings have increased international awareness of the importance of improved estimation procedures of genetic correlations and in 2004 an Interbull Technical Workshop was devoted to this topic.

Key Words: International Evaluations, Conversion Equations, Interbull


The International Bull Evaluation service combines national dairy bull evaluations and provides results on each participating country scale. Theoretically, this process is designed to avoid favoring one country relative to another, but this concern has been raised frequently by international marketers of bull semen. Existence of a bias is difficult to assess; one approach is to compare evaluation results for full brothers from different countries. On average, these full brothers have the same genetics and should have similar evaluations. Over 12,000 Holstein bulls in 4336 full-brother families linked yield evaluations from 20 countries having bulls in at least 25 multi-country families. Slightly fewer bulls and families were in 16 countries with SCS data. The model analyzed with SAS® GLM included fixed effects of full-brother family (absorbed) and home country, where home country was the country of most daughters. To improve estimates of within-family variation, 6761 single-country families were also included. Primary analyses were on the US scale but results were similar on other scales. Full brothers from several countries had significantly higher evalu-
351 Multiple-trait multiple-country genetic evaluations of dairy bulls for udder health traits. T. Mark,1 P. G. Sullivan,2 1Interbull Centre, SLU, Uppsala, Sweden, 2Canadian Dairy Network, Guelph, Ontario, Canada.

Udder health is an economically important trait group and several measures of clinical and sub-clinical mastitis describe this trait complex. Interbull routinely computes two separate single-trait-by-multiple-country genetic evaluations (ST-Mace) for clinical mastitis (CM) and milk somatic cell (SC), for bulls from more than 20 countries. Separate evaluations are sub-optimal and it is desirable to extend ST-Mace to allow more than one trait per country. The aim of this study was to quantify the expected gains for Multiple-Trait-by-Multiple-country genetic evaluations (MT-Mace) compared with the current ST-Mace for udder health. For this purpose national SC (and CM) results from 8 (and 3) Holstein populations were considered. In MT-Mace, weighting factors were adjusted to account for residual correlations, while within country genetic correlations were considered in a multivariate deregession procedure. Predicted international genetic merits, of all bulls evaluated, were highly correlated between MT-Mace and ST-Mace, for SC in all 8 countries (>0.99), and for CM in all 3 countries (>0.98) when SC from the remaining 5 countries was included in the ST-Mace analysis for CM. Among several groups of bulls studied, the international predictions were most strongly affected for bulls that had national evaluations for both CM and SC in the same country. The genetic correlations from the ST-Mace model were also used for MT-Mace, so these results may change once correlations are re-estimated for the MT-Mace model, based on observations generated by the multivariate deregession procedure. Essentially the same results that required two 8-trait ST-Mace analyses, for these 11 traits of interest, were generated with a single 11-trait MT-Mace analysis. Additional traits for some or all countries could also be added into the MT-Mace system, for example udder depth, fore udder attachment, dairy form or milking speed. However, reduced-rank algorithms or other computational techniques may be needed to implement MT-Mace for a very large number of country-by-trait combinations, especially for the estimation of required covariances.

Key Words: International Evaluation, Clinical Mastitis, Milk Somatic Cell

ADSA Southern Section: Innovative Approaches to Address the Changing Needs of Our Dairy Industry

352 Innovative staffing models to enhance dairy educational programs. V. Ishler, L. Holden, and R. Stup, Pennsylvania State University, University Park.

Universities are challenged with having fewer resources available to conduct educational programming. Dairy extension programs provide educational opportunities, but the complex planning processes, numerous departmental and geographic divisions and multiple academic responsibilities of traditional specialists make effective coordination of programs difficult. Penn State’s department of dairy and animal science recognized that progressive dairy producers were being faced with challenges that were outside the discipline oriented programs of tenure-track dairy faculty. Critical gaps in educational programs for dairy producers and the agricultural industry were not being addressed in a timely manner. In-depth focus groups were conducted with agriculture and producers to determine their educational needs. These groups identified four areas of critical need: information management, human resource management, business management and nutrient management. A new initiative, “Dairy Alliance”, was launched to provide a system to integrate all available resources and to respond to the identified needs of the dairy industry. It was designed so highly skilled individuals could be hired in a timely manner with a specific expertise in a particular area. Positions were non-tenure track for a fixed-term basis giving greater flexibility to make program changes compared to traditional tenure-track positions. Dairy Alliance is organized as a self-managing team with specialists in the key program areas and a program manager who organizes activities and resources. A tenure-track faculty member and the department head of Dairy and Animal Science guide Dairy Alliance. The results of this new initiative have surpassed expectations. New relationships have been forged with key members of the dairy industry. An additional specialist has been hired to coordinate a dairy certification program and to address producer needs in milking management. Dairy Alliance is positioned to be a leading dairy extension/outreach program in the United States.

Key Words: Dairy, Education, Outreach

353 A dairy consultant’s perspective on the changing needs of our dairy industry. N. Ohanesian, Consulting Nutritionist, Clovis, CA.

Dairymen in the western states have become dependent on nutrition consultants to assure their herds are properly fed and supplemented to achieve maximum production and health. In addition to the nutrition and feeding aspects of their herds, dairymen have become dependent on the nutritional consultant for advice on management aspects such as herd record analysis, breeding, disease, environmental issues, labor utilization, equipment evaluation, etc. Therefore, a professional nutritional consultant must become proficient in all management aspects of the industry. Proficiency means staying current in feeding strategies, current events, new products, new equipment, university and industry research and record keeping programs. The most precious commodity the consulting nutritionist has is time, he or she must balance their schedule with continuing education. Professional meetings must be evaluated for the information being offered along with the locations and time so that the consultant can schedule efficiently. Professional organizations such as American Dairy Science Association (ADSA) and American Registry of Professional Animal Scientists (ARAPAS) are the foundation for continuing education. ADSA meetings offer the broadest spectrum of current research and techniques utilized by the consulting nutritionist. Membership in ARAPAS and a regional chapter bring professional animal scientists together. Continuing education seminars such as those offered by the California chapter of ARAPAS, are shorter in duration and target a specific technical topic. The consulting nutritionist has the opportunity to interact with industry and university professionals on a friendly and informal basis. This interaction is valuable in that professionals are able to exchange ideas and experiences that are helpful in increasing the knowledge base for those participating. Recent trends in the dairy industry have been larger dairy farms with integration of farming and milk. The consulting nutritionist of the future will have a larger role in the management team of the dairy farm if he or she has a solid academic background and the ability to bring together theory with practicality.

Key Words: Consultant, Professional, Dairy