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at the 100th Anniversary Celebration of the
USDA-ARS Animal Improvement Programs Laboratory in
Beltsville, Maryland
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Thank you, Duane, for that kind introduction, and good morning ladies and gentlemen. On behalf of the USDA Agricultural Research Service, I'd like to add my own welcome to all of you to this 100th anniversary celebration of the Animal Improvement Programs Laboratory (AIPL).

I am delighted you are here today to help recognize AIPL's truly remarkable achievements … to learn a little bit about the path its research has taken and is going … and to provide your further inputs on the direction that path should take in the future.

At the outset, I also want to extend my congratulations—and those of all of ARS—to Dr. Norman and all the Laboratory staff, both past and present, on this momentous occasion.

Not many Federal laboratories can claim 100 years of history—and a number of them that can, I am proud to say, are in ARS. The longevity of AIPL speaks not only to the importance of its work and outstanding achievements, but also to the long-standing support of its customers and stakeholders, who are the users and beneficiaries of the Laboratory's research accomplishments.

I want to acknowledge that many of these organizations are represented here today. They include Dairy Herd Information affiliates, artificial-insemination industries, breed registry societies, and members of dairy industry organizations worldwide, as well as dairy producers. ARS and AIPL have had long and successful relationships with all of these groups as research partners. Also we are pleased that our university and other Federal agency research partners are with us today.

Let me put a bit of historical perspective on the work of AIPL by borrowing a nearly direct quote from a history review authored by Dr. Paul VanRaden and Dr. Bob Miller: "In the beginning, dairy cow breeders had no data."

This statement, I believe, truly captures the essence of the information and knowledge void that AIPL faced when it was established … but has since filled through its century of research.

The story of dairy cattle is as old as our country itself, with a milk cow a staple on every family farm. Cattle breeding specifically for dairy purposes began in the late 1800s, and as people began to move from farms to the cities around the turn of the century, it became necessary to mass produce and improve the quality of milk.

The fledgling dairy industry was beset with problems, however. It had a low rate of efficiency, knowledge of cattle feeding and food supplies was limited, there were no guidelines for breeding or for culling poor cows from the herd, and methods for producing highly sanitary milk were woefully inadequate.

Nonetheless, the dairy industry became so prominent in the agricultural economy that the USDA Bureau of Animal Industry, which was established in 1884 as the first real scientific organization within USDA, in turn established the Dairy Division in 1895 to pursue research

and education for the benefit of the industry. Its goal was to improve the quality of American dairy products and make them more acceptable for export to other countries.

AIPL had its beginning, as a part of this Division, with the establishment of a national milk-recording program in 1908. Two years later the Bureau of Animal Industry purchased the farm at Beltsville, Maryland—now the Beltsville Agricultural Research Center—to provide facilities for carrying on experimental work … almost half of the initial 475 acres was assigned to the Dairy Division.

An early ground-breaking accomplishment was the development of statistical techniques to study the relative influences of heredity and the environment in determining the appearance of desirable traits. The resulting ability to define relationships among animals and inbreeding coefficients effectively launched the Laboratory's cattle inbreeding program. By 1925, dairy breeds were being described and their yields compared, and cow records were being sorted and tabulated on *electric machines*. In 1935, milk records were available for only about 2% of dairy cows; now it's over 40%.

In 1954, the research functions of the Bureau of Animal Industry were transferred to the Agricultural Research Service, which was established on November 3, 1953. Coincidentally, the entire Agency's 55th anniversary is just next week, and our Agency-wide legacy of research accomplishments and beneficial impacts has certainly been contributed to and shaped by AIPL and its predecessor organizations.

The past 55 years of both AIPL's and ARS' history have seen quantum leaps in improving methods for dairy genetic evaluation. They include herdmate comparisons to evaluate sires to better account for differences in management techniques; a process called the Modified Contemporary Comparison to determine genetic trends; daughter-dam comparisons to yield information on within-herd heritability; and animal models to evaluate relationships among all cows and bulls.

Driven by these and even earlier genetic, technological, and production management improvements, output per cow and total milk production have moved ever upward over the past century. In the very first 10 years of the Dairy Herd Improvement program, average yearly milk production increased by nearly 20%, from 5,400 pounds to 6,600 pounds per cow.

Since 1970, national total milk production has risen by almost half, even though milk cow numbers have declined by about one-fourth. Milk production per cow nearly doubled, from 9,700 pounds per year to nearly 19,000 pounds.

In the spirit of innovation that has characterized AIPL over the past 100 years, the Laboratory continues to embark on exciting new phases of research. Genotypes and new phenotype data will be collected to improve the accuracy and comprehensiveness of the national dairy database … The accuracy with which economically important traits are evaluated will continue to improve … The merit and potential for developing genetic predictions for new traits will be determined ... And methods for the use of high-density genomic data will be investigated. A major thrust for 2009 is to incorporate genomics into international evaluations.

Also, in the very near future, a couple of *million* reports from the dairy industry will become available, with new information on metabolic health traits and disease. They will provide an unprecedented opportunity for AIPL to study the respective roles of management,

quantitative genetics, and genomics, and to determine new and better ways of optimizing and improving the health of dairy and cattle populations.

To borrow another line from Paul VanRaden and Bob Miller's review and upcoming presentation this morning, AIPL is just getting started.

In addition to the Laboratory's important research and benefits to U.S. dairy production, its reputation as a premier research center has attracted visiting scientists and students from Europe, the Middle East, and Asia. The knowledge and technology shared have benefited dairy breeding and production programs worldwide, including in the U.S. We are pleased to have a number of our international research partners and industry stakeholders with us today who will tell us more about these collaborations and benefits.

I know we are all looking forward to a day filled with interesting information, discussions, and the exchange of ideas that will even further enhance AIPL's ability to advance its research and meet the important needs of the dairy industry.

Thank you all once again for being here today to celebrate AIPL's 100th birthday and its record of accomplishments. Again, my congratulations to AIPL staff. We look forward with high expectations to another century of outstanding and relevant research to help meet the increasing global demand for high-quality, abundant, and affordable dairy food products.