



**"ENSURING FOOD
SECURITY IN THE
TROPICS THROUGH
LIVESTOCK GENETIC
IMPROVEMENT"**

ACES INTERNATIONAL PROGRAMS
DEPARTMENT OF ANIMAL SCIENCES
DR. CRYSTAL ALLEN
DR. MATTHEW B. WHEELER

2023 INTERNATIONAL FOOD SECURITY SYMPOSIUM

**TUES. APRIL 4 - WED. APRIL 5
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TUESDAY, APRIL 4

ACES INTERNATIONAL PROGRAMS



College of Agricultural,
Consumer &
Environmental Sciences
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

8:30 AM

WELCOME

9:00 AM

**ANIMAL SOURCE FOODS: IMPORTANCE TO DEVELOPMENT
OF PEOPLE AND ECONOMIES**

DR. GEOFFREY DAHL

10:00 AM

LIVESTOCK AND INTERNATIONAL DEVELOPMENT

DR. SARAH JANZEN

11:15 AM

A HISTORICAL VIEW OF LIVESTOCK IMPROVEMENT

DR. TERESA BARNES

12:15 PM

LUNCH

1:15 PM

**WHAT HELPS GENETIC IMPROVEMENT PROGRAMS
SUCCEED?: LESSONS FROM US HISTORY**

DR. JARED HUTCHINS

2:30 PM

**IMPROVING CATTLE WITHOUT ELIMINATING
INDIGENOUS BREEDS**

MR. LEMALY OLE KIBIRITI

3:30 PM

CLOSING

3:45 PM

POSTER PRESENTATION



WEDNESDAY, APRIL 5

ACES INTERNATIONAL PROGRAMS



College of Agricultural,
Consumer &
Environmental Sciences
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

8:30 AM

WELCOME

9:00 AM

DROUGHT, FEED SHORTAGE IN TANZANIA

DR. MOSES OLE-NESELLE

10:00 AM

**ART FOR GENETIC IMPROVEMENT OF CATTLE IN THE
TROPICS FOR IMPROVED FOOD AND INCOME SECURITY**

DR. MATTHEW WHEELER

11:15 AM

**NUTRITIONAL STRATEGIES FOR IMPROVED MILK
PRODUCTION - A GLOBAL PERSPECTIVE**

DR. PHIL CARDOSO

12:15 PM

LUNCH

1:15 PM

**SUSTAINABLE DAIRY FARMING - MICRO & MACRO
PERSPECTIVES**

DR. CHANAKA RABEL

2:30 PM

**IMPROVING SUSTAINABILITY AND PROFIT OF TROPICAL
DAIRY FARMS IN BRAZIL- SCIENCE SUPPORTING PRACTICES**

DR. LUIZ GUSTAVO R. PEREIRA

3:30 PM

FINAL CLOSING





BIOGRAPHY

UNIVERSITY OF FLORIDA

DR. GEOFFREY E. DAHL IS THE HARRIET B. WEEKS PROFESSOR IN THE DEPARTMENT OF ANIMAL SCIENCES, AND THE DIRECTOR OF THE USAID FEED THE FUTURE INNOVATION LAB FOR LIVESTOCK SYSTEMS AT THE UNIVERSITY OF FLORIDA, GAINESVILLE. HE PREVIOUSLY SERVED AS CHAIR OF

THE DEPARTMENT FOR 12 YEARS, SERVING AS LIAISON BETWEEN THE UNIVERSITY, LIVESTOCK PRODUCERS, AND ALLIED INDUSTRIES IN FLORIDA. DR. DAHL CONDUCTS APPLIED AND BASIC RESEARCH WITH DIRECT IMPACT ON DAIRY PRODUCTION. DR. DAHL IS A MEMBER OF SEVERAL PROFESSIONAL AND HONORARY SOCIETIES INCLUDING THE AMERICAN DAIRY SCIENCE ASSOCIATION (ADSA), THE AMERICAN SOCIETY OF ANIMAL SCIENCE, THE SOCIETY FOR THE STUDY OF REPRODUCTION, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS), AND THE ENDOCRINE SOCIETY. HE SERVED AS PRESIDENT OF ADSA FROM 2018 TO 2019. GEOFF HAS RECEIVED NUMEROUS AWARDS INCLUDING THE AWARD OF HONOR FROM ADSA AND IS A FELLOW IN AAAS.

LECTURE SUMMARY

ANIMAL SOURCE FOODS: IMPORTANCE TO DEVELOPMENT OF PEOPLE AND ECONOMIES

THE FOCUS OF OUR WORK IN THE LIVESTOCK SYSTEMS INNOVATION LAB IS TO IMPROVE THE NUTRITION AND LIVELIHOODS OF PREGNANT AND LACTATING WOMEN AND CHILDREN UNDER 2 IN FEED THE FUTURE COUNTRIES BY INCREASING ACCESS TO ANIMAL SOURCE FOODS. THE IMPACT OF GREATER SUPPLIES OF ANIMAL SOURCE FOODS ON PHYSICAL AND COGNITIVE STUNTING WILL BE DISCUSSED, ALONG WITH POTENTIAL EFFECTS ON ECONOMIC DEVELOPMENT IN THOSE COMMUNITIES.



BIOGRAPHY

UNIVERSITY OF ILLINOIS

DR. SARAH JANZEN IS ASSISTANT PROFESSOR OF AGRICULTURAL AND CONSUMER ECONOMICS AT THE UNIVERSITY OF ILLINOIS URBANA CHAMPAIGN. DR. JANZEN ANALYZES GLOBAL POVERTY DYNAMICS AND DISCOVERS INNOVATIVE SOLUTIONS FOR SUSTAINABLE INTERNATIONAL AGRICULTURAL DEVELOPMENT.

LECTURE SUMMARY

LIVESTOCK AND INTERNATIONAL DEVELOPMENT

LIVESTOCK CONTRIBUTE TO THE WELFARE OF RURAL POOR HOUSEHOLDS IN MANY WAYS. LIVESTOCK PRODUCTS CAN BE CONSUMED, UTILIZED, OR SOLD FOR INCOME. IF CONSUMED, LIVESTOCK FACILITATE IMPROVED FOOD SECURITY AND NUTRITION. INCOME FROM LIVESTOCK SALES CAN BE USED FOR CONSUMPTION - INDIRECTLY CONTRIBUTING TO FOOD SECURITY AND NUTRITION - OR INVESTED. IN THE ABSENCE OF DEVELOPED FINANCIAL MARKETS, LIVESTOCK ALSO PROVIDE A SAVINGS MECHANISM, POTENTIALLY ENHANCING RESILIENCE. IN ADDITION, LIVESTOCK OWNERSHIP CAN BE PARTICULARLY IMPORTANT FOR RURAL WOMEN. IN THIS PRESENTATION, DR. JANZEN WILL PROVIDE A BROAD OVERVIEW OF LIVESTOCK FOR INTERNATIONAL DEVELOPMENT, SETTING THE STAGE FOR LATER PRESENTATIONS.



BIOGRAPHY

UNIVERSITY OF ILLINOIS

DR. TERESA BARNES IS THE DIRECTOR OF THE CENTER FOR AFRICAN STUDIES, AND AN ASSOCIATE PROFESSOR IN THE DEPARTMENTS OF HISTORY, AND GENDER & WOMEN'S STUDIES AT UIUC.

LECTURE SUMMARY

A HISTORICAL VIEW OF LIVESTOCK IMPROVEMENT

THIS PRESENTATION REVIEWS SOME OF THE AFFECTIVE ASPECTS OF CATTLE OWNERSHIP AND CAUTIONARY DYNAMICS OF COLONIAL-ERA LIVESTOCK POLICIES IN EASTERN AND CENTRAL AFRICA.



BIOGRAPHY

UNIVERSITY OF ILLINOIS

DR. JARED HUTCHINS IS AN ASSISTANT PROFESSOR IN THE DEPARTMENT OF AGRICULTURAL AND CONSUMER ECONOMICS. HIS RESEARCH AGENDA ENCOMPASSES THE ECONOMICS OF THE LIVESTOCK SECTOR, THE ROLE OF GENETIC TECHNOLOGY IN AGRICULTURAL INNOVATION, AND

THE ROLE OF INSTITUTIONS IN AGRICULTURAL DEVELOPMENT. HIS WORK HAS APPEARED IN APPLIED ECONOMICS PERSPECTIVES AND POLICY, AMERICAN JOURNAL OF AGRICULTURAL ECONOMICS, AND THE JOURNAL OF AGRICULTURAL AND RESOURCE ECONOMICS

LECTURE SUMMARY

WHAT HELPS GENETIC IMPROVEMENT PROGRAMS SUCCEED?: LESSONS FROM US HISTORY

GENETIC IMPROVEMENT IS AN IMPORTANT COMPONENT OF PRODUCTIVITY GROWTH IN THE LIVESTOCK SECTOR. WHY DO SOME GENETIC IMPROVEMENT PROGRAMS SUCCEED AND OTHERS DO NOT? THE SUCCESS OF GENETIC IMPROVEMENT PROGRAMS DEPENDS ON A NUMBER OF SOCIAL, ECONOMIC, AND INSTITUTIONAL FACTORS. IN THIS TALK, I DISCUSS HOW THE EXPERIENCE OF THE US DAIRY SECTOR HIGHLIGHTS THE IMPORTANCE OF SOME OF THESE FACTORS. IN PARTICULAR, I DISCUSS HOW MARKET INCENTIVES, SUPPLY CHAINS, AND FARMER COOPERATIVES HAVE BEEN KEY COMPONENTS TO SUCCESSFUL GENETIC IMPROVEMENT IN THE US DAIRY SECTOR.



BIOGRAPHY

AFRICAN WILDLIFE FOUNDATION

LEMALY IS A LIVESTOCK OFFICER WITH THE AFRICAN WILDLIFE FOUNDATION AT MANYARA RANCH. HE HAS 8 YEARS OF EXPERIENCE MANAGING LIVESTOCK ON THE RANCH WHILE ENGAGING AND STRENGTHENING RELATIONSHIP BETWEEN THE MANAGEMENT OF

THE RANCH AND LOCAL COMMUNITIES LIVING ADJACENT TO THE RANCH. HE IS MOTIVATED AND DRIVEN BY THE PASSION TO HELP PASTORAL COMMUNITIES IMPROVE THE PRODUCTIVITY AND VALUE OF THEIR INDIGENOUS CATTLE THROUGH THE IMPLEMENTATION OF COMMUNITY LIVESTOCK DEVELOPMENT PROGRAM.

LECTURE SUMMARY

IMPROVING CATTLE WITHOUT ELIMINATING INDIGENOUS BREEDS

INDIGENOUS BREEDS OF CATTLE ARE THE BREED OF ANIMALS WITH SIMILAR FEATURES AND THAT HAVE ORIGINATED IN AND BEING PRODUCED, GROWING, LIVING, OR OCCURRING NATURALLY IN A PARTICULAR REGION OR ENVIRONMENT. OF THE MORE THAN 800 CATTLE BREEDS RECOGNIZED WORLDWIDE, AT LEAST 150 INDIGENOUS AFRICAN CATTLE BREEDS HAVE BEEN NAMED, BUT MAJORITY OF AFRICAN CATTLE POPULATIONS REMAIN LARGELY UNCHARACTERIZED. THESE BREEDS HAVE IMPORTANT FUNCTIONS RANGING FROM PROVISION OF FOOD AND INCOME TO SOCIO-ECONOMIC, CULTURAL AND ECOLOGICAL ROLES. THEY ALSO HAVE ADAPTIVE TRAITS RANGING FROM DROUGHT TOLERANT, RESISTANCE TO TICKS AND TICK-BORNE DISEASES, HEAT TOLERANCE AND RESISTANCE TO TRYPANOSOMIASIS.



BIOGRAPHY

FOOD AND AGRICULTURE ORGANIZATION

DR. MOSES OLE-NESELLE, IS AN EXPERIENCED VETERINARY SURGEON TRAINED MAASAI FROM NORTHERN TANZANIA WITH VAST KNOWLEDGE ON LIVESTOCK PRODUCTION IN THE TROPICS. HE IS A LIVESTOCK DEVELOPMENT SPECIALIST HAVING EXPERIENCE

IN TRAINING PROGRAM DEVELOPMENT, PROJECT DESIGN AND RESEARCH METHODS AND TECHNIQUES. CURRENTLY DR. OLE-NESELLE'S INTEREST IS SEEING THAT THE TROPICAL LIVESTOCK BREED IN TANZANIA POSSESS IMPROVED POTENTIAL TO CONTRIBUTE TO NUTRITION AND FOOD SECURITY FOR THE RESPECTIVE LIVESTOCK PRODUCING COMMUNITIES KNOWN AS PASTORALISTS.

LECTURE SUMMARY

DROUGHT, FEED SHORTAGE IN TANZANIA

LIVESTOCK PLAYS MULTIPLE ROLES IN THE LIVELIHOOD STRATEGIES OF RURAL COMMUNITIES. IN MANY COMMUNITIES, LIVESTOCK IS INTRICATELY LINKED TO SOCIAL STATUS THROUGH ACCUMULATION OF WEALTH AND SAVINGS. IT ALSO PROVIDES A VARIETY OF BENEFITS TO RURAL COMMUNITIES SUCH AS RISK MITIGATION, FOOD SECURITY AND IMPROVED NUTRITION. THE LIVESTOCK INDUSTRY CONTRIBUTION TO THE AGRICULTURAL GROSS DOMESTIC PRODUCT IS QUITE LOW. THIS MAINLY IS DUE TO LOW LIVESTOCK GROWTH RATES, HIGH MORTALITY RATES DUE TO DROUGHT AND DISEASES, LOW REPRODUCTIVE RATES AND POOR QUALITY OF THE FINAL PRODUCTS FROM THE INDUSTRY. DROUGHT IS NOW AN EVENT THAT MAKES CURRENT MANAGEMENT CHALLENGES FACED BY LIVESTOCK PRODUCERS EVEN MORE DIFFICULT THAN IT WAS PREVIOUSLY.



BIOGRAPHY

UNIVERSITY OF ILLINOIS

DR. WHEELER IS A PROFESSOR AT THE UNIVERSITY OF ILLINOIS IN URBANA. HE HAS A PH.D. FROM COLORADO STATE UNIVERSITY, SPECIALIZING IN PHYSIOLOGY AND BIOPHYSICS. DR. WHEELER HAS STUDIED DEVELOPMENTAL BIOLOGY, GENOMICS AND REGENERATIVE MEDICINE SINCE

1976 PUBLISHING MORE THAN 200 PEER-REVIEWED ARTICLES, CHAPTERS AND TECHNICAL ARTICLES. DR. WHEELER'S RESEARCH INTERESTS INCLUDE ASSISTED REPRODUCTION, TISSUE ENGINEERING, STEM CELL BIOLOGY, ANIMAL MODELS FOR REGENERATION, MICROFLUIDICS, REMOTE SENSING OF EMBRYO METABOLISM AND EMBRYONIC HEALTH, NMR EMBRYO IMAGING AND DEVELOPMENT OF CLIMATE-ADAPTED LIVESTOCK.

LECTURE SUMMARY

ASSISTED REPRODUCTIVE TECHNOLOGIES FOR GENETIC IMPROVEMENT OF CATTLE IN THE TROPICS FOR IMPROVED FOOD AND INCOME SECURITY

DR. WHEELER'S PRESENTATION WILL COVER THE USE OF ASSISTED REPRODUCTIVE TECHNOLOGY TO PRODUCE TROPICAL-ADAPTED CATTLE. HE WILL DESCRIBE THE IMPLEMENTATION OF THE TECHNOLOGY, THE BENEFITS/LIMITATIONS OF THIS APPROACH AND THE RESULTS THAT CAN BE ACHIEVED USING THESE TOOLS. DR. WHEELER WILL DISCUSS HOW GENETIC IMPROVEMENT CAN BE GREATLY ACCELERATED USING ASSISTED REPRODUCTION. HE WILL DISCUSS EXAMPLES OF HOW THIS TECHNOLOGY HAS IMPROVED LOCAL FOOD PRODUCTION AND HOW IT CAN DIRECTLY IMPACT INDIVIDUAL FARMER INCOME.



BIOGRAPHY

UNIVERSITY OF ILLINOIS

DR. PHIL CARDOSO IS AN ASSOCIATE PROFESSOR AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN. HE RECEIVED HIS D.V.M., AND M.S. DEGREES FROM THE FEDERAL UNIVERSITY OF RIO GRANDE DO SUL IN BRAZIL AND HIS PH.D. FROM THE UNIVERSITY OF

ILLINOIS. SINCE 2012, PHIL HAS ESTABLISHED A UNIQUE PROGRAM AND ONLINE PRESENCE THAT SEAMLESSLY BLENDS HIS TEACHING, EXTENSION, AND RESEARCH EFFORTS. HIS PROGRAM BUILDS FROM QUESTIONS FROM DAIRY PRODUCERS AND FOCUSES ON HAVING THE DAIRY COW'S DIET AS A MEDICAL PRESCRIPTION FOR PERFORMANCE, HEALTH, AND REPRODUCTION.

LECTURE SUMMARY

NUTRITIONAL STRATEGIES FOR IMPROVED MILK PRODUCTION - A GLOBAL PERSPECTIVE

FEEDING DAIRY COWS FOR THEIR REQUIREMENTS IS CRUCIAL FOR DAIRY FARMERS' PROFITABILITY. EVERY YEAR, RESEARCHERS WORLDWIDE HELP DAIRY FARMERS, VETERINARIANS, AND NUTRITIONISTS BETTER UNDERSTAND THE BIOLOGICAL MECHANISMS THAT MAKE COWS UTILIZE AND EFFECTIVELY CONVERT FEED INTO MILK. DURING THE INTERNATIONAL FOOD SECURITY AT ILLINOIS (IFSI) SYMPOSIUM, DR. PHIL CARDOSO (UNIVERSITY OF ILLINOIS) WILL DISCUSS THE NUTRITIONAL STRATEGIES AND GOALS FOR A SUCCESSFUL FEEDING PROGRAM, SUCH AS FOR A COW TO CALVE, NOT GET SICK, MILK WELL, AND THEN GET PREGNANT AGAIN IN A TIMELY FASHION. NEGATIVE ENERGY BALANCE IS ONE OF THE MOST SIGNIFICANT CHALLENGES ASSOCIATED WITH THE PERIPARTURIENT PERIOD THAT INTERFERES WITH THESE GOALS. THE CORRECT DIET WILL MEET THE COW'S NUTRITIONAL REQUIREMENTS AND BE DESIGNED SO THAT COWS GET JUST WHAT THEY NEED, NOT MORE, NOT LESS.



BIOGRAPHY

DR. CHANAKA RABEL GOT HIS DEGREE IN VETERINARY MEDICINE AND ANIMAL SCIENCE (2003) FROM THE UNIVERSITY OF PERADENIYA, SRI LANKA, AND HIS MS (2008) AND PHD (2012) FROM THE UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN, USA. HE THEN SERVED THE UNIVERSITY OF PERADENIYA AS A SENIOR

LECTURER WHERE HE TAUGHT 'DAIRY FARM MANAGEMENT' AND 'GENETICS & BREEDING' TO VETERINARY UNDERGRADUATE AND POST-GRADUATE STUDENTS. HE IS CURRENTLY SERVING AS A VISITING SCHOLAR AT THE DEPARTMENT OF ANIMAL SCIENCES, UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN WHERE HE CONDUCTS RESEARCH ACTIVITIES RELATED TO ASSISTED REPRODUCTIVE TECHNOLOGIES AND STEM CELL THERAPIES.

LECTURE SUMMARY

SUSTAINABLE DAIRY FARMING - MICRO & MACRO PERSPECTIVES

THE DAIRY INDUSTRY IS FACED WITH VARIOUS 'MICRO' AND 'MACRO' CHALLENGES THE WORLD OVER. A 3-PRONGED MITIGATION STRATEGY INVOLVING DAIRY ANIMALS, THE PUBLIC, AND THE ENVIRONMENT, HAS BEEN IDENTIFIED TO OVERCOME THESE CHALLENGES, AND TO SUSTAIN THE DAIRY INDUSTRY. THIS PRESENTATION WILL FOCUS ON KEY MITIGATION STRATEGIES INVOLVING OPTIMIZATION OF DAIRY MANAGEMENT PRACTICES, IMPROVEMENT OF WELFARE OF BOTH ANIMALS AND EMPLOYEES, AND CONSERVATION OF THE ENVIRONMENT.

DR. LUIZ GUSTAVO



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R. PEREIRA



BIOGRAPHY

EMBRAPA

DR. LUIZ GUSTAVO R. PEREIRA OBTAINED A VETERINARY BACHELORS' (1999) AND PH.D IN ANIMAL SCIENCE (2003) FROM THE FEDERAL UNIVERSITY OF MINAS GERAIS, BRAZIL. HE IS CURRENTLY A RESEARCHER AT EMBRAPA AND WAS A VISITING RESEARCHER AT THE UNIVERSITY OF WISCONSIN-

MADISON, WORKING ON PROJECTS FOCUSED ON PRECISION LIVESTOCK FARMING, RUMINANT NUTRITION AND LIVESTOCK SUSTAINABILITY.

LECTURE SUMMARY

IMPROVING THE SUSTAINABILITY AND PROFIT OF TROPICAL DAIRY FARMS IN BRAZIL-SCIENCE SUPPORTING PRACTICES

THIS PRESENTATION WILL DISCUSS HOW SCIENCE HAS BEEN CONTRIBUTING FOR THE DEVELOPMENT OF THE BRAZILIAN DAIRY INDUSTRY. SHOWING THE IMPROVEMENT OF GRAZING SYSTEMS, THE IMPROVEMENT OF ZEBU AND CROSS BREED CATTLE, AND SOME EXAMPLES OF APPLICATION OF REGENERATIVE AND SUSTAINABLE PRACTICES IN TROPICAL CONDITIONS OF BRAZIL AND LATIN AMERICA.

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DR. CRYSTAL ALLEN



DR. MATTHEW WHEELER



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