The Challenge of Change: Engaging Public Universities to Feed the World
The Challenge Part 1

Despite progress toward eradicating hunger, 800 million people are food insecure worldwide. (FAO, 2015)

In the U.S., an estimated 14.3% of households (17.5 million people) were food insecure at some time in 2013. (USDA, 2015)

The World Food Program estimates: 1 in 6 children (nearly 100 million) are underweight. 1 in 4 are stunted. 3.1 million children under 5 die each year due to poor nutrition.
The Challenge Part 2

Global demand for agricultural products is expected to grow 1.1% per year from 2005/2007-2050, primarily due to population growth, increases in per-capita consumption, and changing diets.

In order to match this projected increase in demand, by 2050 global food production must be 60% higher than it was in 2005/2007.

This level of global food production must be achieved within the context of:

- Growing environmental problems
- Water demands
- Energy costs
- Issues related to the distribution, utilization, and waste of food.

(FAO, 2012)
Our Response

Universities are uniquely equipped, by virtue of their broad-ranging subject matter expertise and global experience, to respond to the multi-dimensional issues that impact global food security.

At public and land-grant universities all relevant disciplines are present and can come together to address these complex issues.

Systemic change, new funding patterns, innovations in public policy and governance, and unprecedented global partnerships are needed.
Focus and Cross-Cutting Areas
Commission Objectives

To identify key constraints to our food system’s ability to sustainably feed the world

To identify how institutions of higher education can best provide knowledge to remove food security constraints

To identify how resources from the public and private sector can be aligned to support solutions
Malnutrition is a significant threat to human health. Globally we face a double burden of
malnutrition—undernutrition and overweight. Lack of access to proper nutrition and
unhealthy food choices compromise mental and physical health and limit productivity,
output and earning potential. Overweight and obesity worldwide contribute to a rise in
life-threatening chronic diseases that are costly to treat and tax already overburdened
health systems.

To address more effectively this grand challenge, universities must:
1. Incentivize integration of expertise to assess food security and nutrition needs,
deliver appropriate solutions, and evaluate impact on nutrition, human development
and health.
2. Leverage partnerships to improve local, national, as well as global food and
nutrition security.
3. Engage expertise to understand food selection behaviors and encourage the eating of healthy foods.
GRAND CHALLENGES:
Engaging Public Universities to Feed the World

David C. Weindorf, Ph.D., P.G.
• Associate Dean of Research
• BL Allen Endowed Chair of Pedology
• Fulbright Scholar
What threats do we face?
What are the issues?

- Increasing population
- Decreasing arable lands
- Marginal lands
- Food safety/security
- Gender inequity
- Access to water
- Disease/pestilence
Do we have the capacity?

Yes; for the most part

We always want newer, more advanced equipment, but all of our laboratories are 50 years ahead of developing countries

Beyond equipment, we have the know-how to address the issues
Do we have the willingness/time?

Just because we have the expertise, doesn’t mean it is easy getting the work done

- Academic freedom vs. faculty engagement
- Pulled in many directions
  - State
  - Federal
  - Private industry
  - Foundations
  - International
Tradeoffs?

Does work in developing countries diminish gains in our domestic agricultural production?

- I would argue no, but that is the perception of some
- Can we make larger gains in food production/security in other countries by applying some of our technology?
  - Should we?
  - Will they even accept it?
- “How does your trip to Romania benefit the taxpayers of the state of Louisiana?”
- “It is our business, what they think does not matter”

What is the right thing to do, for the benefit of humanity?
The Grand Challenge – The Grand Balance

What motivates a faculty member?

- Research advancements
- Student engagement/success
- Personal curiosity/fulfillment
- Lifestyle
- Diversity
- Career advancement, tenure, etc.
- Making a difference

What motivates a university?

- Money
  - Grants, tuition, endowments, etc.
- Student enrollment/success
- Research prominence
- Institutional ranking/stature
- Alumni achievements
- Athletics performance
- Diversity
- International engagement
Between Earth and Sky – Climate Change on the Last Frontier

- Feature length documentary film exploring the impacts of climate change from the perspective of arctic soils and ecosystems
- Major funding provided by Texas Tech Univ.
Requirements of grand challenges

- Boldness
- Unconventionality
- Forward thinking (vision)
- Nimbleness
- Alacrity
- Engagement/warmth
- Results
- Communication
Together, we can take on the world’s greatest challenges

And from here, it’s possible…
The Challenge of Change:
Strategies for Addressing Grand Challenges at the University of Minnesota

Raymond Duvall
Special Assistant to the Provost for Grand Challenges Research; Professor, Political Science
Preeminent in solving the grand challenges of a diverse & changing world

Embrace excellence and reject complacency

Recruit and retain field-shaping researchers and teachers

Build exceptional research and curriculum integrating grand societal challenges

Capitalize on our location, build a culture of reciprocal engagement
Grand Challenges Research

Leveraging our exceptional strengths for expanded impact on the most critical challenges of our state, nation, and world.
Feeding the World Sustainably

Produce, distribute, and maintain safe and sufficient food supplies through environmentally sustainable practices to ensure the vitality of growing and demographically diverse populations.
Mobilizing Campus-Wide Involvement: 
Accelerating Advancement of Excellence in Grand Challenges Research

- Initial funding - 6 broadly interdisciplinary teams under “Feeding the World Sustainably.”

- Faculty from:
  - Biological Sciences
  - Food, Agricultural and Natural Resources
  - Liberal Arts
  - Science and Engineering
  - Veterinary Medicine
  - Humphrey School of Public Affairs
  - Law School
  - Academic Health Center
  - Institute on the Environment

- In addition, we’ve involved:
  - Global Programs and Strategies Alliance
  - Graduate School
  - Undergraduate Research Opportunities Program (UROP)
  - University of Minnesota Extension
  - University-wide interdisciplinary centers
DRIVING TOMORROW

Find more information at http://strategic-planning.umn.edu

Comments or questions can be directed to gcrsrch@umn.edu
Indigenous Food Systems

APLU Annual Meeting

November 14, 2016

Donald Warne, MD, MPH

Oglala Lakota

Chair, Department of Public Health

North Dakota State University
Traditional View of Public Health
Diabetes Death Rates
(Rate/Per 100,000 Population)

US All Races: 25.2
IHS Total: 77.7
Great Plains Area: 119.9
Diabetes Prevalence
Australia

Per cent
15
10
5
0

Aboriginal and Torres Strait Islander people
Non-indigenous people
Diabetes Prevalence
New Zealand and Pacific Islands
NDSU MPH Program Mission

The program’s mission is to promote health and well-being in diverse populations with an emphasis on American Indian and other underserved populations by providing educational, practical, and research opportunities for public health professionals.
NDSU Specializations/Tracks

- Health Promotion
- Management of Infectious Diseases
- Public Health in Clinical Systems
- American Indian Public Health
NDSU Grand Challenges Approach

College of Health Professions

Dept. of Public Health

MPH/AIPHRC

American Indian Public Health Faculty
NDSU Grand Challenges Approach

- College of Health Professions
  - Dept. of Public Health
    - MPH/AIPHRC
      - American Indian Public Health Faculty
- College of Human Development and Education
  - Dept. of Health, Nutrition, and Exercise Science
    - RD, MPH
      - Public Health Nutrition Faculty
American Indian Public Health Day
Impact of a Traditional Seed Priming Method on Human Health Relevant Bioactives of The Three Sisters Crops

Abstract

The Three Sisters crops were an integral part of many North American Indigenous food systems. Different traditional seed priming techniques had been used to improve the germination and growth of these Sister Crops over centuries. The major goal of this study was to evaluate the impact of a traditional indigenous seed priming (human activity involved) on the germination rate, seed vigour, and antioxidant activity and health promoting bioactive profiles of beans and corn-based seeds under a Three Sister Crop food environment. Further, phenolic, flavonoid, and total antioxidant content were measured, for the management of early stages of type 2 diabetes. The results concluded that a very high correlation was recorded for all the nutritional and physico-chemical parameters. The study demonstrated that the seed priming had a significant impact on the total antioxidant capacity and phenolic content of the seeds. The study highlighted the potential of traditional seed priming techniques in improving the nutritional and health promoting properties of the Three Sisters Crops.

Background

Throughout most of North America, what remains of the traditional agricultural system of the Three Sisters crops, beans, and corn is small, but it is a vital source of nutrition and health. This system is an important component of the broader effort to revitalize and preserve Indigenous knowledge and culture. Traditional seed priming techniques have been shown to improve the germination rate, seed vigour, and antioxidant activity of these crops. The study aims to evaluate the impact of a traditional indigenous seed priming on the health promoting bioactives of the Three Sisters Crops.
AIPH in Future Generations

"Let us put our minds together and see what life we can make for our children."

Sitting Bull
Donald Warne
donald.warne@ndsu.edu
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