Linking Agriculture, Nutrition, and Health: The Role of the Registered Dietitian Nutritionist

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As the world population continues to rapidly increase to a predicted 9 billion people by 2050, the types of food we grow will have a direct impact on human and environmental health. We must grow adequate amounts of food, the right types of food, and do it in a manner that respects the earth's environment and limited resources. Many leading global health organizations and governments are prioritizing nutrition and agriculture interventions. However, a gap exists where registered dietitian nutritionists (RDNs) and dietetic associations can contribute to and lead efforts these efforts.

People in every country in the world suffer from some form of malnutrition, and both undernutrition and overnutrition lead to adverse health outcomes. It is estimated that 1 billion are undernourished from a lack of calories, and 2 billion have micronutrient deficiencies, the highest among them are vitamin A, iodine, iron, and zinc.[1] Calorie and micronutrient deficiencies lead to childhood stunting, impairment of mental and physical development, and negatively impacts productivity of individuals and communities. Overnutrition—overweight or obesity, is a risk factor for many noncommunicable diseases, such as cardiovascular diseases, cancers, diabetes, and chronic lung diseases. According to the World Health Organization, noncommunicable diseases were responsible for 68% of all deaths in 2012.[2]

One of the world's greatest challenges of the 21st century will be to sustainably feed the growing global population with increased demand for finite resources such as water, land, and minerals. Of the 7.2 billion people on earth, 1.2 billion live on less than an adjusted $1.25 per day. Fortunately, the global middle class is expected to increase significantly by 2030, and as family incomes rise, prosperity provides the opportunity to consume a more nutrient-dense, diverse, and varied diet.[3] However, trends show that developing countries are shifting toward diets higher in saturated fats and refined carbohydrate, leading to increased rates of chronic diseases.[4-6] The Academy of Nutrition and Dietetics recognizes the importance of working with other organizations to promote sustainable agriculture while improving global health outcomes.

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http://dx.doi.org/10.1016/j.jand.2015.06.009
Available online 29 July 2015

ALIGNING CONFERENCE GOALS WITH THE ACADEMY'S INTERNATIONAL STRATEGIC PLAN

The Academy's international strategic plan helps to illuminate the need for consensus around the RDN's role at the global intersection of agriculture, nutrition, and health. Therefore, a conference was hosted by the Academy and its Foundation in December 2014 to find consensus among nutrition leaders and continue the advancement of our profession.[7]

Conference Development and Academy Member Representation

The conference goals were established to guide presentations, discussions, and achieve constructive outcomes. Twenty-one nutrition experts were invited to particpiate, which featured eight expert presentations and focused discussion opportunities. Each attendee was invited to represent a specific practice area within dietetics (see the Acknowledgements section). The results were analyzed with focused coding techniques as a way to identify themes, highlights, and opportunities for increased global nutrition capacity.

Consensus Conference Goals

1. *Advance sustainable agricultural practices and production methods:* Assess the current landscape in the intersection of agriculture, health, and nutrition to identify where the Academy and its members can help to strengthen current efforts.
2. *Increase accessibility to sufficient amounts of nutrient-dense foods that promote optimal health*: Evaluate global initiatives that are seeking to improve public health, and identify niches for RDNs to help improve nutrition intervention outcomes.
3. *Increase Global Capacity for RDNs*: Consider the breadth of current dietetics education, and assess the need to integrate knowledge and skills in agriculture, health, and nutrition to better prepare future professionals.

CHIEF CONFERENCE THEMES

Identifying the Need for RDN Involvement

Rich dialogue and expert presentations revealed many opportunities for the Academy and its members to help advance nutrition security and improve global health outcomes. The discussions were framed around the three conference goals. Four priority actions were identified for the Academy and RDNs to focus on: fostering collaboration; educating the public and health professionals; identifying outcome standards; and advocating for global nutrition security (Figure 1). The

following summarizes the conference dialogue and highlight key messages.

Advancing Sustainable Agriculture Practices across the Food Supply Chain

Conference attendees agreed that RDNs should apply their expertise to advance the nutritional value chains of our food supply. From farm to fork, improving food sustainably is critical to achieving nutrition security and lessening agriculture's environmental impact. By 2050, we will need to double the production of food on the same amount of land currently used today.[8] Prominent areas of RDN contribution include promoting agriculture innovation and sustainable farming techniques; advocating for safe, nutritious, and efficient food processing, packaging, storage, and transportation; collaborating with retailers to increase access of nutrient-dense foods and encourage healthy options; and educating consumers on evidence-based nutrition information to facilitate adoption of healthy eating behaviors (Figure 2).

RDNs have opportunities across the entire food supply chain to promote food waste reduction and to provide education on food storage and preservation. Resource management was a priority focus area of conference attendees. Roughly one-third of the food produced for human consumption, about 1.3 billion tons per year, is lost or wasted.[9-13] Producing this much food accounts for 6% to 10% of human-generated greenhouse gas emissions.[14] Reducing food waste is a simple mitigation technique that affects all sides of the food supply chain, and it can reduce environmental impact through lower agricultural inputs (ie, fresh water, fertilizers, pesticides), and lower emission outputs.[11] With agriculture currently producing 30% to 40% of the world's greenhouse gasses, these steps toward reducing emissions from the agricultural sector are essential to reducing the risks of climate change.[15]

Increasing Accessibility to Nutrient-Dense Foods that Promote Optimal Health

Lack of access to healthy, nutrient-dense foods continues to be a global issue that increases risk for malnutrition and chronic disease.

Figure 1. Registered dietitian nutritionist priority action areas in the intersection of agriculture, nutrition, and health.

Currently, the world produces enough food to feed everyone; however, the problem lies within the distribution, access, and affordability of foods. The United Nations Food and Agriculture Organization estimates that about 805 million people of the 7.3 billion people in the world, or one in nine, are suffering from chronic undernourishment 2014.[16] The Food and Agriculture Organization fully recognizes that nutrition-sensitive agricultural development and food-based approaches are

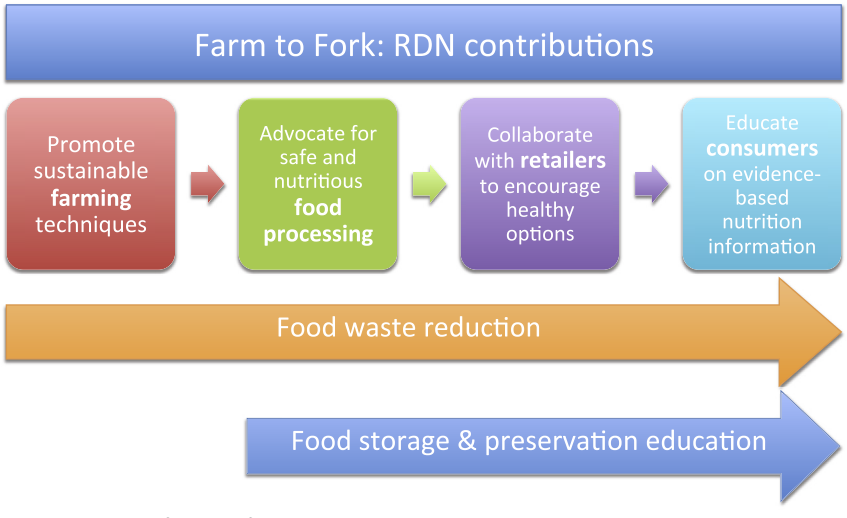

Figure 2. From farm to fork: registered dietitian nutritionist (RDN) contributions.