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Why We Need a Ruminant Revolution: Combating Malnutrition and Metabolic Illnesses to Enable Sustainable Development

Peter J. Ballerstedt
Barenbrug USA

David B. Hannaway
Oregon State University

T. D. Noakes
Cape Peninsula University of Technology, South Africa

Why We Need a Ruminant Revolution: Combating Malnutrition and Metabolic Illnesses to Enable Sustainable Development

Ballerstedt, P.J.[*]; Hannaway, D.B. [†]; Noakes, T.D. [††]

* Forage Ambassador, Barenbrug USA; † Professor and Forage Program Director, Oregon State University, USA; †† Adjunct Professor, Cape Peninsula University of Technology, Cape Town, South Africa

Abstract

Animal source foods (ASF) are essential for proper human development and function. Livestock in general, and ruminants in particular, are essential components of our sustainable global food systems. Of significant worldwide impact, diets with higher-than-recommended levels of ASF can correct the symptoms of metabolic illnesses, offering hope in arresting the current worldwide epidemic of diabetes and other metabolic diseases. Most dietary policy and recommendations are based on the ill-founded belief that plant-based, high-carbohydrate diets are "healthy." High-quality scientific evidence does not support the belief that vegetarian diets are healthier than omnivorous or animal-based diets. A Therapeutic Carbohydrate Reduction (TCR) lifestyle approach has demonstrated its efficacy in reversing Insulin Resistance (IR) and the non-communicable diseases associated with, or caused, by it. True sustainability is a multifaceted topic consisting of societal, economic, and ecological aspects. The enormous suffering and financial costs of chronic illness must be acknowledged. The production of high-quality animal protein and animal fat by ruminants from feed resources humans cannot directly utilize will be fundamental to feeding a growing population. This essential food production can preserve and enhance the diverse environments where it takes place. We need a revolution in our thinking of what constitutes a healthy diet, of what causes chronic illness, of the vital role that animal product play in the human diet, and the essential nature of ruminant animal agriculture in meeting humanity's needs. This will mean overthrowing established policies and institutions, and confronting vested belief systems. We'll need an effort, analogous to the Green Revolution, to develop and deploy the knowledge and technology necessary to meet the needs of the mid-21st Century world.

Introduction

Based upon the highest quality scientific evidence available, we must more effectively communicate these objective realities: 1) Too much of humanity suffers from too little animal source foods (ASF) in their diet (Adesogan et al 2019; Berg 2019); 2) There is insufficient evidence to recommend reducing ASF consumption, even in high-income countries (Carroll and Doherty 2019); 3) Dietary interventions based upon reducing processed carbohydrates and ensuring adequate ASF offer enormous promise in lower the global burden of non-communicable diseases (Bikman 2020); 4) Grasslands and ruminant animal agriculture are essential to sustainable foods systems and sustainable development globally. Given: The global epidemic of metabolic diseases; The failure of the global human nutrition leadership to acknowledge the weak scientific basis of their dietary guidance and their failure to reverse this epidemic; And their inability to incorporate the highest-quality scientific evidence available into their guidance and policies, we argue that those of us in grassland agriculture and ruminant animal agriculture must stop accepting their pronouncements, stop citing them in our research, and challenge their legitimacy wherever possible.

Approach

Our paper is intended as a "call to action." We hope to introduce this argument and provide sufficient references to permit further investigation, encourage individuals to improve their own health, and initiate action by the International Grasslands Congress and its participating organizations and members.

Results

Malnutrition Today

Despite the advances made in agricultural productivity resulting from the so-called "Green Revolution," approximately 800 million human beings are still calorically under-nourished (World Hunger Education Service 2018), while 2.2 billion are overweight or obese (Ng 2014). These observations might seem paradoxical to those not familiar with the current state of the research on human nutrition and metabolic health. A viewpoint informed by this body of work understands, however, that this condition is what should be expected from malnourished populations (Taubes 2007).

In 2012, the World Health Assembly (WHA) agreed on six global targets for improving maternal, infant and young child nutrition to be achieved by 2025 (WHO 2012). In 2015, the Sustainable Development Goals established a global agenda for substantial improvement in nutrition by the year 2030, setting a specific objective of ending all forms of malnutrition by 2030, including achieving the 2025 targets and addressing the nutritional needs of adolescent girls, pregnant and lactating women, and older persons (FAO 2018).

It has been estimated that by 2050: The global population will reach 9.8 billion (UN 2017), 70% of which will live in urban areas (Bryce 2020); Food production must double (UN 2009); Demand for animal source protein will increase by 66% (FAO 2017). Major gains in efficiency of livestock systems are needed if these predictions and the 2030 goals of the Agenda for Sustainable Development are going to be met (FAO 2017).

Animal source foods are essential for human development and health (Adesogan et al. 2019). Ruminant animal agriculture offers unique ecological advantages over other methods of ASF production (CAST 1975), but improvements in grassland management and ruminant animal agriculture are required if increased productivity with reduced environmental impacts are to be achieved (Capper and Bauman 2013; FAO 2017). Public health policy and advocacy by numerous interest groups (e.g., see Banta et al. 2018) has been decidedly anti red meat, animal fat, and ruminant animal agriculture for almost half a century (Leroy and Hite 2020). Their arguments are based on upon health claims, environmental issues, and personal beliefs/feelings. While largely unsupported by high-quality scientific evidence, their efforts have influenced policy priorities and therefore the funding needed for the research and development efforts necessary to advance grassland agriculture.

The Unsustainable Burden

Non-communicable (or chronic) diseases (NCD) account for 71% of all deaths globally (WHO 2018). While most dietary policy is informed by the belief that obesity is the *cause* or a *risk factor* for much of this burden, high-quality scientific evidence strongly suggests that insulin resistance and hyperinsulinemia are at least aggravating, if not causal factors (Crofts 2015; Bikman 2020).

Dietary policies and nutrition education have been primarily guided by the results of Nutritional Epidemiology of Chronic Disease (NECD) surveys and cohort studies (Hite 2018). Eighty percent of the findings of NECD have been *dis*proven by subsequent clinical trials (Young and Karr 2018). Despite the investment of billions of United States (US) dollars since Keys and his colleagues proposed (and then promoted) the hypothesis that naturally-occurring saturated fatty acids in the diet caused heart disease (Key et al. 1955), "[t]he evidence implicating natural dietary fats in heart disease has evaporated over the years" (Taubes 2020). Despite this failure, dietary guidance remains to eat less red meat and low-fat dairy products, the primary products of grassland agriculture.

IR is the epidemic that few have heard of. Half of all adults in the US, and roughly one in three Americans are known to have it (Menke et al. 2015). Almost 90% of US adults have one or more conditions of metabolic ill-health (Araújo et al. 2019). Contrary to the "plagues of prosperity" narrative, low-income countries have passed high-income countries in terms of the total number of people with the condition (Roglic et al. 2016). Eighty percent of all individuals with IR now live in low- and middle-income countries and, as in America, half of all adults in China and India are insulin resistant (Roglic et al. 2016). The number of people with diabetes are predicted to increase by 150% in the next 25 years (WHO and IDF 2004).

The overwhelming majority of people with IR don't know they have it and have never heard of it (Bikman 2020). Educational efforts have been and will continue to be hampered by the conventional wisdom that Type 2 Diabetes (which is IR) is *caused* by obesity, sedentary behaviour, and an unhealthy diet (which is defined as one containing too much animal source foods, especially red meat). All of these are incorrect (Taubes 2007; Bikman 2020). The social, economic, and environmental burdens of this epidemic of malnutrition are unsustainable.

An Effective Approach

The historical origins of carbohydrate restriction (CR) dates back to 1825 when Jean Anthelme Brillat-Savarin published *The Physiology of Taste* (Taubes 2007). In 1864, William Banting's *Letter on Corpulence* reached a remarkably wide audience for its time. In the early 20th century, interest in therapeutic carbohydrate restriction (TCR) resurfaced in the context of two chronic diseases: diabetes mellitus and epilepsy. Interest waned with the introduction of exogenous insulin and anti-seizure medications (Westman et al. 2006; Freeman 2013). Carbohydrate restriction for weight loss was revived in the 1960s and 1970s by several authors followed by another wave in the 1990s (Taubes 2007). These low-carbohydrate (LC), weight-loss diet books far outsell those produced by the American Heart Association and the Dietary Guidelines for Americans (which promote low-fat, high carbohydrate diets (Blackburn et al. 2001), suggesting that the results produced by the former

surpass those of the latter (Taubes 2020). The portrayal of these diets in the media as "fad diets" for "quick weight loss" obscures their utility in clinical settings as interventions for specific conditions (Society of Metabolic Health Practitioners 2020). In spite of this coverage and the opposition by various medical/special interest groups, there has been a revival of interest in LC diets as clinical interventions for specific conditions. Most notably for this discussion, varying degrees of CR have been found to be one of the most effective dietary interventions for treatment of type 2 diabetes, surpassing the effects produced by medications and producing drug-free remission. A recent Western Australian government report states that remission, rather than just management, should be the goal of interventions for type 2 diabetes and that a LC diet should be one of the options formally offered to patients with this diagnosis (Freeman et al. 2019). A 2019 consensus statement from the American Diabetes Association indicates that LC diets should be included as one of the nutrition therapy options offered to people with type 2 diabetes. The report also notes that "Reducing overall carbohydrate intake for individuals with diabetes has demonstrated the most evidence for improving glycemia and may be applied in a variety of eating patterns that meet individual needs and preferences" (Evert et al. 2019). Dr. David Unwin, a U.K. general practitioner, has demonstrated to the National Health Service (NHS) how a low-carbohydrate diet can save money by offering patients an alternative to medications. In recognition of his work, Dr. Unwin has been named a Royal College of General Practitioners Clinical Expert in Diabetes and NHS Innovator of the Year 2016.

Grasslands' Role
Members of the International Grasslands Congress are aware of the critical role that grasslands play in our global ecosystems, the ecosystem services provided by grassland agriculture, and the role that livestock play in sustainable development. Unfortunately, in addition to all the work being done in the disciplines of grassland and rangeland sciences, we must now become familiar with the scientific literature regarding the role of grassland agriculture's primary products (red meat and full-fat dairy) play in human nutrition and health. There are a variety of dietary approaches that qualify as LC and TCR, but they typically include a higher amount of ASF (including red meat and full-fat dairy products) than commonly recommended.

Call to Action
Humanity must improve the productivity and efficiency of our grassland agricultural systems to sustainably contribute to the higher quality and greater quantity of food to the global food supply if the sustainable development goals are to be met. This will require: A more inclusive understanding of malnourishment; An unbiased appreciation of the role of ASF in human nutrition and health; The role of IR in NCD; And a greater appreciation of our global ruminant agriculture systems and the grasslands they (and all of us) depend upon. Given the failure of the traditional experts on human health and nutrition, those in grassland agriculture must educate ourselves on these subjects. We must stop giving their pronouncements credence without rigorous challenges. Their unfounded pronouncements have contaminated our scientific literature and their ill-founded policies affect research and development funding priorities.

On the personal level, the membership of this body needs to understand how to feed themselves. Odds are that a significant number of members currently have IR and its related conditions and could benefit from a LC lifestyle intervention. People who have experienced this health journey often become advocates.

The theme for the 2023 International Grasslands Congress is "Grasslands for Soil, Animal and Human Health." It is our hope that between now and then this organization and its members respond to this call, improve their own health when appropriate, and promote our enterprises as the foundation for alleviating the global scourge of IR and its associated diseases.

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