



Energy Balance at a Crossroads: Translating the Science into Action

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ONE OF THE MAJOR CHALLENGES facing the United States is the high number of overweight and obese adults, along with the growing number of overweight and unfit children and youths. To improve the nation's health, young people must move into adulthood without the burden of obesity and its associated chronic diseases. To address these issues, the American College of Sports Medicine, the Academy of Nutrition and Dietetics (the Academy), and the US Department of Agriculture's (USDA) Agriculture Research Service convened an Expert Panel meeting in October 2012, entitled "Energy Balance at a Crossroads: Translating the Science into Action." Experts in the fields of nutrition and exercise science came together in Washington, DC, to identify the biological, lifestyle, and environmental changes that will most successfully help children and families understand the dynamic nature of energy balance and tip the scale toward healthier weights. The desired outcome of this expert panel meeting was to translate the science of energy balance into practical and appropriate recommendations for training current and future professionals in nutrition,

exercise/physical activity (PA), health education, and prekindergarten through grade 12 teacher education. This included discussing the associated components necessary to achieve and maintain a healthy body weight. The specific goals are as follows:

1. **Professional Training:** Develop a comprehensive strategy to facilitate the integration of nutrition and PA education—emphasizing the dynamic nature of energy balance in the regulation of weight—into the training of undergraduate and graduate students in dietetics/nutrition science, exercise science/PA, and prekindergarten through grade 12 teacher preparation programs, as well as into the training of existing Cooperative Extension faculty.
2. **Consumer and Community Education:** Develop best practices for integrating education on the dynamic nature of energy balance into new and currently-funded state and federal nutrition and PA programs for preventing and/or reducing obesity.

The Expert Panel meeting was divided into three sections. The first section addressed the biological and lifestyle factors that impact energy balance, the second section addressed undergraduate and graduate educational and training issues, and the final section addressed best practices associated with educating the public, including consumers and communities, about the dynamic nature of energy balance. Key points addressed by each speaker are summarized here and followed by the group consensus recommendations for each goal.

EXAMINING BIOLOGICAL AND LIFESTYLE FACTORS INFLUENCING THE DYNAMIC NATURE OF ENERGY BALANCE

The concept of energy balance for regulating body weight is simple in principle. When energy expenditure exceeds energy intake, weight is lost. When energy intake exceeds energy expenditure, weight is gained. Because of the high prevalence of obesity in the United States, interventions for prevention and treatment of obesity have typically focused on reducing energy intake, increasing energy expenditure, or a combination of these strategies. Although these interventions have shown success, weight change might be less than expected, and not all individuals respond to these interventions in a similar manner.^{1,2} A potential factor contributing to individual variability in weight regulation, with different patterns of diet and PA, can be the type of intervention used. Dietary interventions to reduce energy intake or efforts to increase energy expenditure through PA are often treated as separate and independent approaches. For example, suggesting that a 500 kcal/day deficit from energy intake will consistently yield 1-lb weight loss per week (eg, 3,500 kcal=1 lb) for everyone.¹⁻³ This static approach to energy balance does not take into account the impact that changing energy intake has on total energy expenditure.⁴ By definition, energy balance is a dynamic, not static, process in which altering one component of the energy-balance paradigm can affect the physiological and biological components of the other in an unpredictable or unintended way⁴⁻⁶ (see Figure 1). We know that body weight is regulated by a number of factors, including genetic, metabolic, environmental, social, and behavioral components, which

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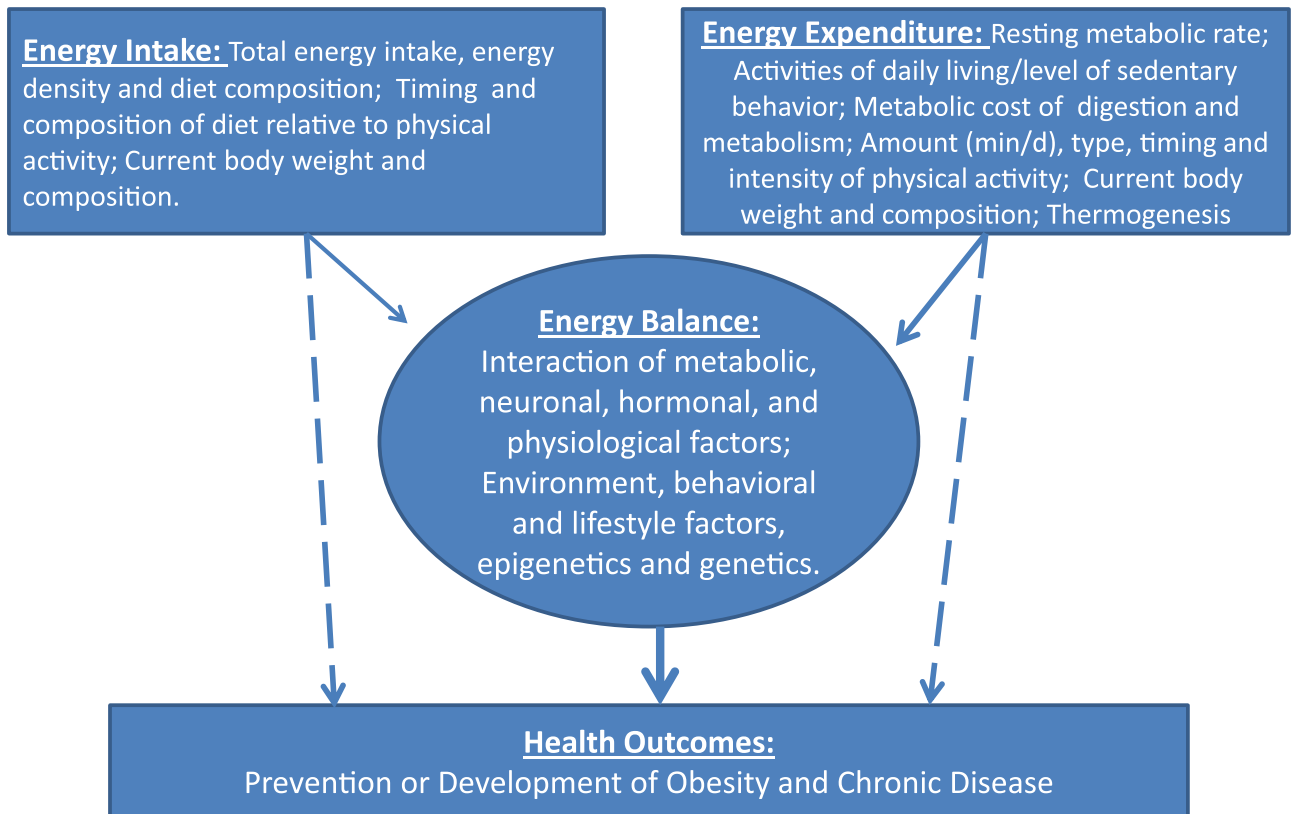


Figure 1. Key factors that regulate and influence energy balance, which can ultimately influence weight, body composition, and overall health.

can influence both sides of the energy balance equation differently, depending on the individual and the circumstances.^{4,2,7} This concept is important as we ascertain the contribution of dietary factors, including macronutrient composition, and PA factors, including varying modes, intensities, and quantities, on energy balance. With this new information we can refine recommendations to improve the regulation of body weight and composition.

We now have strong scientific evidence supporting the benefits of consuming a healthy diet and being physically active for improved health and longevity, achieving or maintaining a healthy body weight, and reducing risks of chronic disease.⁸⁻¹¹ Although the amount of daily PA required to significantly improve the health of most sedentary Americans is within reach,¹¹ there has been little success in motivating the vast majority of people to add even this modest level of PA into their lifestyle.¹² The biggest question for the new millennium might not be “what” or “how much,”

but simply “how” to make sustainable lifestyle changes that foster healthy body weight.

The “small changes” approach has had some success.¹³ This approach emphasizes small consistent changes in lifestyle to eliminate the energy gap that leads to weight gain. However, even this method requires individuals to find a compelling reason to sustain this behavior change in the face of competing life priorities.¹⁴ One promising approach might be to shift the focus away from the emphasis on health (eg, appropriate diet and PA) to discussing other benefits, such as improved learning, cognition, and productivity in the workplace. Rather than aiming at self-actualization as the motivator, more basic motivators of human behaviors could be used to help individuals thrive in the modern world, such as education and employment, which provide the means for acquiring the basic elements for survival. If the reason for building recommended guidelines for diet and PA into schools was to improve classroom learning and

test scores, the discussion might change. The outcome would be better-educated children who are able to more successfully compete in the marketplace. Likewise, the workplace could be transformed if healthy living, derived using science and evidence-based PA and healthy eating practices, were an expectation of employers because it improves productivity. More research is needed on the effectiveness of using an “alignment of purpose and incentives” approach in different settings throughout society.

Finally, consumers also need to embrace and understand the role of diet and PA in managing body weight. The high prevalence of overweight and obesity in the United States has increased the importance of balancing energy (calories) consumed and energy expended to achieve and maintain a healthy weight and body composition. Numerous policy and educational efforts aim to help consumers achieve energy balance. Still, the International Food Information Council Foundation’s *2012 Food & Health Survey* consistently

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