Chapter 9
Dairy: Environmental Concerns, Health, and Alternatives

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ABSTRACT

In many parts of the world, dairy is consumed daily, while in other parts, dairy consumption is uncommon. Regardless, the impact dairy has on sustainability and health raises many questions. There are a growing number of options to dairy milk, including many nut and grain milks. Many of these options are new, so research is limited on their consumption and impact on sustainability and health. This chapter provides an overview of milk consumption around the world, sustainability, health concerns, and dairy milk alternatives. In addition, advantages and disadvantages are discussed, as individuals are often faced with choosing the option that best meets their individual needs.

INTRODUCTION

Dairy milk consumption varies significantly around the world. An estimated two-thirds of the world's population is lactose intolerant (Renub Research, 2018), yet the dairy industry was the third largest market in the global food and beverages market in 2017 (Global Dairy Market Briefing, 2018). Dairy production and consumption are connected to many environmental and health concerns. A few of the challenges include land, water, antibiotic use, feed, equipment, animal treatment, and sanitation. There is growing debate over human dairy consumption. As more milk alternatives become available and popular, this chapter will concentrate on the arguments for and against dairy milk consumption, as well as the environmental impact of the dairy industry across the world.

The purpose of this chapter is to present research on dairy consumption, sustainability, and human health. Specifically, the chapter will present research on the arguments surrounding dairy consumption around the world relating to, (1) sustainability (2) health and (3) alternatives.

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The objectives of this chapter include:

1. Dairy Milk Consumption Around the World: Providing a brief history of milk consumption around the world.
2. Dairy Milk Consumption and Sustainability: Providing an overview of dairy milk production.
3. Dairy Milk Consumption and Health Concerns: Providing an overview of the various health concerns and complications with dairy milk consumption.
4. Alternatives to Dairy Milk: Providing an overview of the growing number of dairy milk alternatives.
5. Limitations of Current Research: Providing limitations of current research.

BACKGROUND: DAIRY MILK CONSUMPTION AROUND THE WORLD

Historical studies show that fluid dairy consumption was rare in the Netherlands, Sweden, Scotland, Hungary, Germany, and in other parts of Europe; the buttermilk and whey that resulted from making butter was often used to feed livestock (Dupuis, 2002). Milk became more commonly used as a breast milk substitute in the mid-1800s as the United States became more urban, although it was often dangerous due to limited sanitation (Dupuis, 2002).

Dupuis (2002) explains the story of how milk became viewed as a perfect food in the United States and how and is part of social relationships. She points out that drinking fluid milk is not an ancient custom, but rather new to modern times and that northern European countries typically consumed preserved or fermented forms of cheese, sour milk, and yogurt, rather than the fluid form. Furthermore, Americans had very limited amounts of milk from colonial times to the mid-nineteenth century. On family farms, the little milk provided would typically be used to make butter and cheese. Dupuis goes on to explain that drinking milk became more common in the 1940s. Americans were drinking over a pint per day as it became a staple of the American diet and for most of the twentieth century, the majority of Americans drank milk in large quantities (Dupuis, 2002).

Hooijdonk and Hettinga (2015) provide an estimated food consumption per capita for major commodities in developed versus developing countries. As of 2005, the average milk consumption per person per year in developed countries was approximately 200 kg, and in developing countries, it was approximately 50 kg. Milk consumption is estimated to increase by approximately 25 kg per person per year in both developed and developing countries (Alexandratos & Bruinsma, 2012).

Dairy products can provide valuable nutrients and may reduce the risk of chronic diseases especially to those living in poverty (Hooijdonk & Hettinga, 2015). In the countries that dairy products are a major resource of nutrients, demand increases with population growth. The estimated increase in food demand in the world is an average of 1.1% per year (Hooijdonk & Hettinga, 2015). By 2050, it is estimated that in parts of the world like Africa, the undernourished population will be over 300 million. In other countries, it is estimated that overeating will significantly increase obesity (Hooijdonk & Hettinga, 2015).

The United States Department of Agriculture has been recommending milk and dairy in food guidelines since 1916. As of 2017, the USDA ChooseMyPlate.gov through the United States Department of Agriculture recommends the amount of food that should be eaten from the Dairy Group depends on age and gender. Children 2-3 years old are recommended to have 2 cups while those 4-8 years old are recommended to have 2.5 cups. Ages 9-18 are recommended to have 3 cups. Both males and females