Chapter 14
Forecasting the Future of Food Emulsifiers

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In many areas, the first cut at forecasting future trends involves observing the past, and then extrapolating the data points into the future. For example, the consumption of food ingredients can be correlated with population and personal income growth. Forecasts of consumer tastes are much more difficult. Scientific and technical innovation generally follows an S-curve. Radical (discontinuous) innovation requires a jump to a new S-curve. Humans are generally disinclined to undertake radical experiments with their food consumption (with the possible exception of fad diets for weight loss). Current controversies surrounding genetically modified plants, cloned animals, and irradiation are prominent examples. Nevertheless, radical innovations in nutrition and technology do occur and stimulate changes in food consumption. Recent examples include the glycemic index and adverse health studies for trans fatty acids.

Food emulsifiers exert several technical effects (see Table 1.1), and can be useful tools to address these new trends. This chapter will discuss some trends that may impact on demands for new and modified emulsifier compositions and applications.

14.1 Globalization of the Food Industry

The food industry has historically been multi-domestic. Local tastes, national food regulations, and the cost of shipping have contributed to localization pressure. However, some strong counter-trends have begun to exert pressures toward globalization. Global communication, industry consolidation, income growth in developing countries, and international travel are a few of these forces. Alcoholic beverages, gourmet foods, and canned meats have been shipped internationally for decades. More recently, confectionery products have been shipping globally.

Shipment of food emulsions and dispersions can be problematic for their chemical, microbiological, and physical stability. For example, vibration may cause separation of an emulsion. The separated aqueous phase may serve as a medium for microbial growth. Many of the developing countries do not yet have widespread refrigeration for small stores and consumers. Food surfactants may help to solve some of these stability problems. Guidance might be obtained from the cosmetic and pharmaceutical industries, since they have developed emulsion/dispersion products which are shelf stable for several years.
As global population continues to expand, food consumption will likewise increase. Arable land will be pressed toward higher yields. Further pressure from development of biofuels, such as ethanol and biodiesel, may be significant. A search for novel and less expensive sources of proteins, fats, and carbohydrates may pose interesting challenges for food product developers. Food surfactants will provide useful tools to optimize the functionality of these novel ingredients.

### 14.2 Nutritionally Driven Changes in Foods

Nutritional studies concerning diet and health, as well as their counterweight, diet and disease, are continually appearing in the literature, often with conflicting interpretations. Predicting trends in this area can be complex and confusing. There are a few areas where there is broad scientific consensus.

#### 14.2.1 Total, Saturated, and Trans Fat Consumption

Obesity has become a serious problem, if not an epidemic, in developed countries. This is likely the result of increasing personal wealth and increasing availability of high calorie foods, which lead to increased consumption. More sedentary lifestyles