In countries where food is abundant, people choose foods based on a number of factors which can in sum be thought of as “quality.” Quality has been defined as degree of excellence and includes such things as taste, appearance, and nutritional content. We might also say that quality is the composite of characteristics that have significance and make for acceptability. Acceptability, however, can be highly subjective. Quality and price need not go together, but food manufacturers know that they generally can get a higher price for or can sell a larger quantity of products with superior quality. Often “value” is thought of as a composite of cost and quality. More expensive foods can be a good value if their quality is very high. The nutrient value of the different grades of canned fruits and vegetables is similar for all practical purposes, yet the price can vary as much as threefold depending on other attributes of quality. This is why processors will go to extremes to control quality.

When we select foods and when we eat, we use all of our physical senses, including sight, touch, smell, taste, and even hearing. The snap of a potato chip, the crackle of a breakfast cereal, and crunch of celery are textural characteristics, but we also hear them. Food quality detectable by our senses can be divided into three main categories: appearance factors, textural factors, and flavor factors.

Appearance factors include such things as size, shape, wholeness, different forms of damage, gloss, transparency, color, and consistency. For example, apple juice is sold both as cloudy and clear juice. Each has a different appearance and is often thought of as a somewhat different product.

Textural factors include handfeel and mouthfeel of firmness, softness, juiciness, chewiness, grittiness. The texture of a food is often a major determinant of how little or well we like a food. For example, many people do not like cooked liver because of its texture. Texture of foods can be measured with sophisticated mechanical testing machines such as the one shown in Fig. 6.1.

Flavor factors include both sensations perceived by the tongue which include sweet, salty, sour, and bitter, and aromas perceived by the nose. The former are often referred to as “flavors” and the latter “aromas,” although these terms are often used interchangeably. Flavor and aroma are often subjective, difficult to measure accurately, and difficult to get a group of people to agree. A part of food science called sensory science is dedicated to finding ways to use humans to accurately describe the flavors and other sensory properties of foods. There are hundreds of descriptive terms that have been invented to describe flavor, depending on the type of food. Expert tea tasters have a language all of their own, which has been passed down to members of their guild from generation to generation. This is true of wine tasters as well.
Since we generally experience the properties of food in the order of (1) appearance, (2) texture, and (3) flavor, it is logical to discuss quality factors in this order now.

**APPEARANCE FACTORS**

In addition to size, shape, and wholeness, pattern (e.g., the way olives are laid out in a jar or sardines in a can) can be an important appearance factor. Wholeness refers to degree of whole and broken pieces; the price of canned pineapple goes down from the whole rings, to chunks, to bits. Appearance also encompasses the positive and negative aspects of properly molded blue-veined cheeses, and the defect of moldy bread, as well as the quality attribute of ground vanilla bean specks in vanilla ice cream, and the defect of specks and sediment from extraneous matter. Although some ice cream manufacturers have added ground vanilla bean as a mark of highest quality, others have concluded that as often as not a less-sophisticated consumer misinterprets these specks and rejects the product.

**Size and Shape**

Size and shape are easily measured and are important factors in federal and state grade standards. Fruits and vegetables can be graded for size by the openings they will pass through. The simple devices shown in Fig. 6.2 were the forerunners of current...