Crop	Kilocalories per Kilogram of Crop (millions)
Soybean	3.3
Corn	3.7
Rice	3.6
Wheat	3.3
Potato	8.2
Sugar beet	8.2

Figure 4-20 Caloric content of several crops (harvested weight)
Source: Data from Borgstrom 1970*b*, p. 45.

3,500 kilocalories per kilogram was used in World3 as an average conversion factor because, to sustain life, low-protein foods must be supplemented with high-protein animal products.

Thus the minimum requirement of 2,200 kilocalories per person-day is equivalent to

$$\frac{2200 \text{ kilocalories}}{\text{person-day}} \times \frac{1 \text{ vegetable-equivalent kilogram}}{3500 \text{ kilocalories}} \times \frac{365 \text{ days}}{\text{year}} = \frac{230 \text{ vegetable-equivalent kilograms}}{\text{person-year}}$$

We define this minimum value of 230 vegetable-equivalent kilograms per person-year or 2,200 kilocalories per person-day as the subsistence food per capita SFPC, a constant that is used both in the definition of the lifetime multiplier from food LMF (see Chapter 2) and in the food ratio FR, discussed later in this chapter.

Indicated Food per Capita IFPC In World3 the total investment in agriculture is primarily determined by the total demand for food. We assumed that the total agricultural investment TAI is increased (decreased) when the available food per capita FPC is below (above) the per capita food demand. As will be discussed, this per capita demand for food, which we termed the indicated food per capita IFPC, was assumed to increase when industrial output per capita IOPC increases (that is, when a higher "economic level" is reached).

Figure 4-21 illustrates the great variation in national per capita food consumption as a function of income in 1968. A similar graph, using 1957–1961 data (Figure 4-22), also shows the shifting pattern from the direct consumption of vegetable crops to the use of vegetable crops for fodder as income increases. In poor countries, nearly all the available grain is consumed directly by the population; very little is fed to animals. With rising income, the total amount of grain consumed per person increases steadily, but much of this additional grain consumption is indirect consumption in the form of milk, meat, and eggs. Whereas the annual amount of grain used directly as food decreases after reaching a maximum, total grain consumption continues to rise. This growing indirect use of grain makes possible the rise in the consumption of

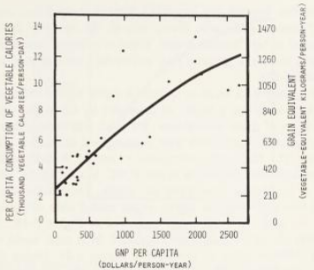

Figure 4-21 Per capita consumption of vegetable calories and GNP per capita for several countries, 1968
Sources: Food consumption data from U.N. 1970*a*; GNP per capita from IBRD 1970.

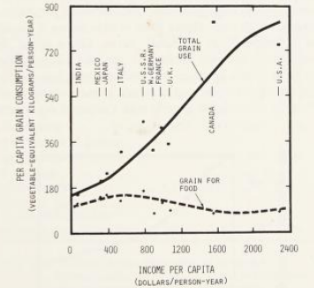

Figure 4-22 Income and per capita grain consumption
As a country becomes wealthier, less grain is used directly for consumption. The strong increase in total use is due to the growth in the indirect use of grain, for example, as feed for meat-producing animals.
Source: Lester R. Brown, *Seeds of Change: The Green Revolution and Development in the 1970's* (New York: Praeger Publishers, 1970), p. 143. Copyright © 1970 by Praeger Publishers, Inc. Excerpted and reprinted by permission.