

Life Support Systems - Part 1 (Food and Soil)

As human populations grow the need for _____ food production also increases. _____ has led to an incredible increase in worldwide food production. The use of modern farming practices has allowed farmers to increase annual food production by over ___ times compared to a century ago. Unfortunately, over the past 15 years global food production has remained _____ (as a total) and _____ on a per capita basis.

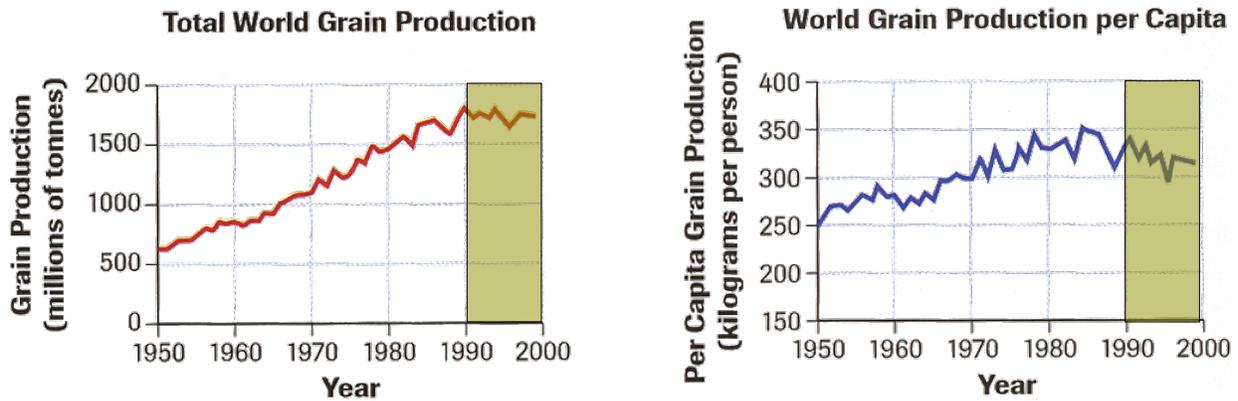


Fig. 1 Trends in world grain production from 1950-2000 (Nelson 12 Biology pg. 714)

We still produce _____ to feed the world's population. Despite this, tens of _____ of people suffer from malnutrition everyday because of the unequal _____ of food. Part of the reason for this is that there is an unequal distribution of _____, but by far the greatest cause is _____. For example, ___% of India's population is undernourished because they do not have enough _____ to buy or grow food. Figure 3 pg. 715

There is abundant evidence that we are reaching the _____ of food production from plant crops (no increase in production for 15 years). The amount of food that can be harvested from the _____ is also becoming limited. Per capita seafood harvest has remained constant at _____ for the last 30 years. The Canadian East Coast _____ is an example of how overfishing can deplete fish stocks. These stocks are not expected to recover for _____ (if at all).

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On land, meat production today has increased by _____ when compared to ___ years ago. This may sound like a positive factor in feeding the world's population, until you realize that the livestock on the planet consume enough food to feed _____ humans. They also place a strain on _____ resources and produce ___ times more bodily waste than an equal number of humans would (potentially polluting water supplies).

A green diet

Energy pyramids are diagrams that are used to show the _____ through the different _____ (feeding) levels of an ecosystem. Ultimately, all energy comes from the _____. Plants and other _____ are able to convert the sun's light energy into food which is then consumed by _____ (like us).

Since all organisms must use energy to carry out their _____, most of the energy that they take in is _____ to the next feeding level. In fact, 90% of the energy at each trophic level is _____ to the environment through metabolism waste products such as _____. Only ___ % of the food energy is passed on through the food chain.

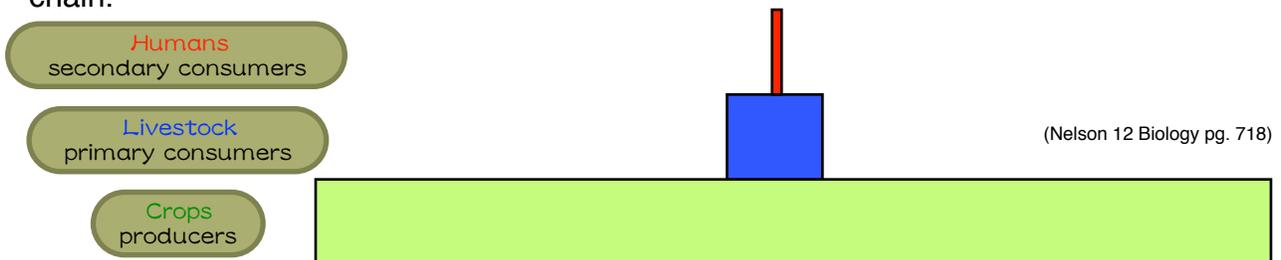


Fig.2 Energy pyramids compare the relative efficiency of energy transfer at different trophic levels

Energy pyramids show that _____ energy is wasted if we eat “_____ on the food chain”. Instead of feeding _____ to livestock and then eating the livestock, we could feed more people by eating the _____ (100 kJ of energy available from crops as opposed to only _____ that end up in the livestock).

In some cases, livestock can eat vegetation that is _____ for humans, thereby converting this _____ into meat, milk or egg products that can be used by humans.