



## Are you what you eat?

### Page 4: **Corn Bones - See for Yourself**

#### **Case Study Problem C-643 Intermediary Metabolism**

The lecture in Rose's anthropology class began more or less as usual, "More than 12,000 years ago during the last ice age, paleolithic big game hunters from Asia entered North America via the Bering land bridge. Soon their descendants had spread to Terra del Fuego at the southern tip of South America. By the time Columbus first encountered native Americans, most lived in tropical and temperate environments and had cultures closely tied to corn. Few issues in anthropology have attracted so much attention or created more controversy than the origin and domestication of corn. Through selective breeding, some group transformed a native grass into a major agricultural crop that in turn transformed their way of life. Where did this happen? When did it happen? Surprisingly, some of the best answers to these questions come from the chemical study of bones and a knowledge of corn biochemistry." Bingo. Rose's ears perked up. She couldn't imagine how a connection could be made.

The explanation that followed was superficial but there was enough information that Rose could get the gist. Basically there was something about photosynthesis in corn that was different than in most other crops. The small but distinctive  $^{13}\text{C}/^{12}\text{C}$  signature for corn that resulted was transmitted to the people who ate the corn. Thus the change from a diverse diet to one dominated by corn could be traced in the carbon from well dated human bones based on the premise that "you are what you eat." Maybe Tony was right after all.

1. **How would you measure the  $^{13}\text{C}/^{12}\text{C}$  ratio in a bone?**
2. **How is it possible for the  $^{13}\text{C}/^{12}\text{C}$  ratio to be different in corn than in many other plants?**
3. **Are there any nutritional problems associated with a diet dominated by corn or any other single food?**

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