

Complementary Proteins

'Our bodies use amino acids in a specific ratio to each other, so if a person doesn't get enough of one of them to match with the rest, the rest can only be used at a level to balance with that low one. Most of these amino acids are fairly easy to get in a reasonably well-balanced diet. However, there are three that are a little harder to get than the rest, thus it is important to make sure you're getting enough of these three. These three are called **limiting amino acids**, because if a person's diet is deficient in one of them, this will limit the usefulness of the others, even if those others are present in otherwise large enough quantities. The three limiting amino acids include the **sulfur-containing** ones (methionine and cysteine), **tryptophan**, and **lysine**.'

'Fortunately, it's not as hard to combine proteins as it sounds like it might be. *Diet for a Small Planet* includes a diagram like this to illustrate protein complementation. (below)

"Fat" arrows are especially good combinations and "thin" arrows are satisfactory combinations.

- Legumes and grains together (refried beans on tortilla in Central America, falafel made from chick peas in whole wheat pita in the Middle East, soybeans and whole rice in the Far East, cornbread and pinto beans down South, peanut butter on whole wheat bread, lentil soup with bread, quinoa salad with black beans and feta) make complete protein.
- Dairy and whole grains (oatmeal and milk, whole wheat macaroni and cheese, cheese sandwich on whole grain bread, yogurt with nuts) are also complete protein.
- Seeds and legumes (Middle Eastern dip known as hummus made from sesame seeds ground up like peanut butter and cooked chick peas) also make a complete protein.
- Nutritious "three-way" combinations are also good: pizza with a whole wheat and soy crust and cheese on top, cheese and refried beans on a corn tortilla, vegetarian lasagna or a peanut butter on whole wheat sandwich with a glass of milk.'



- Legumes with grains, nuts, seeds or dairy
- Grains with dairy
- Dairy with nuts
- Dairy with nuts/seeds and legumes

Source: <http://biology.clc.uc.edu/courses/bio104/compprot.htm>