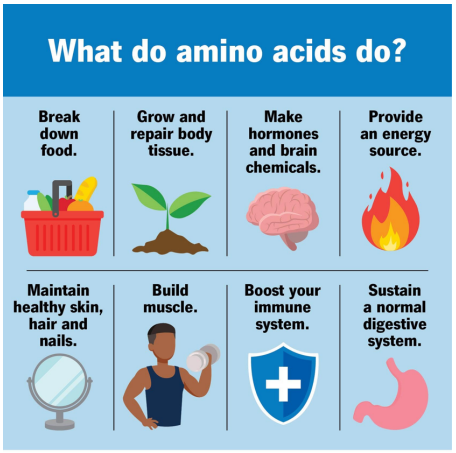
A RoseRed Homestead Info-Sheet

Amino Acids and Food Storage

What are amino acids and why are they important?

Amino acids are molecules that link together by chemical bonding to form proteins in long chains inside our bodies. There are thousands of different kinds of proteins in our bodies, each having a different form and function. Our bodies are constantly reconfiguring these protein chains by breaking them down into individual amino acids and reconfiguring the chains for new purposes needed by our bodies (see chart). This economy of protein metabolism means that there must always be amino acids available for building protein.



What are the different types of amino acids?

There are thousands of amino acids in nature, but only 20 different kinds are critical for our bodies to survive and perform essential functions. Of those 20, eleven can be made by our bodies without us having to provide external building materials and are therefore classified as non-essential amino acids. That leaves nine amino acids that our bodies can't make on their own and we must provide them directly by the food we eat. These nine amino acids are classified as the essential amino acids, and they exist in the food we eat from plants and animals. We must include them in our daily food intake. Some of our food contains all 9 essential acids and these are known as complete protein foods. These foods include most of the meat and dairy foods. Most plant protein is incomplete protein because although it contains abundant protein, one or more of the nine essential amino acids are missing.

What are the 9 essential amino acids and what do they do?
(see https://my.clevelandclinic.org/health/articles/22243-amino-acids)

- **Histidine:** Histidine helps make a brain chemical (neurotransmitter) called histamine. Histamine plays an important role in your body's immune function, digestion, sleep and sexual function.
- **Isoleucine:** Isoleucine is involved with your body's muscle metabolism and immune function. It also helps your body make hemoglobin and regulate energy.
- **Leucine:** Leucine helps your body make protein and growth hormones. It also helps grow and repair muscle tissue, heal wounds and regulate blood sugar levels.
- **Lysine:** Lysine is involved in the production of hormones and energy. It's also important for calcium and immune function.
- **Methionine:** Methionine helps with your body's tissue growth, metabolism and detoxification. Methionine also helps with the absorption of essential minerals, including zinc and selenium.
- **Phenylalanine:** Phenylalanine is needed for the production of your brain's chemical messengers, including dopamine, epinephrine and norepinephrine. It's also important for the production of other amino acids.

- **Threonine:** Threonine plays an important role in collagen and elastin. These proteins provide structure to your skin and connective tissue. They also help with forming blood clots, which help prevent bleeding. Threonine plays an important role in fat metabolism and your immune function, too.
- Tryptophan: Tryptophan helps maintain your body's correct nitrogen balance. It also helps make a brain chemical (neurotransmitter) called serotonin. Serotonin regulates your mood, appetite and sleep.
- Valine: Valine is involved in muscle growth, tissue regeneration and making energy.

Why do we need to think about amino acids when we build up our food storage?

It is critically important that our stored food contain the 9 essential amino acids so that our bodies can build the proteins necessary for our survival during challenging times when our normal sources of foods may no longer exist. The best way to do this is to store a variety of healthy foods. While we do not need to take inventory of the individual amino acids in each food (thankfully!), what we do need to know is which of the foods we are storing contain complete protein and which contain incomplete protein so we can plan a balanced approach to our menus to ensure that we have complete protein intake in our food each day. This can be accomplished by combining two or more foods with incomplete protein that together have all nine essential amino acids, or by eating foods that already contain all nine and are complete protein sources. An example might be a cereal (incomplete) for breakfast with beans (incomplete) for lunch and a meat dish (complete) for dinner. It is not necessary to have a complete protein for every meal, but all our meals together for a single day should include complete protein. In the example, the cereal for breakfast plus the beans for lunch do make a complete protein. Or we could add milk to the cereal for a complete protein and have bread with the beans for a complete protein. There are lots of ways we can combine our stored food to ensure a daily complete protein intake.

What food should we store to ensure we have the essential amino acids?

The foods listed in the table are those that are moderately high in protein content and can be preserved for mid- to long-term storage.

Complete Protein	Complimentary Incomplete Proteins (Select one from any two columns to form a complete protein.)		
	Nuts and Seeds	Legumes	Grains
Dairy Eggs Poultry Beef Pork Fish Mushrooms Quinoa Amaranth Buckwheat	Peanuts Chia Walnuts Pecans Cashews Pumpkin seeds Sunflower seeds Flax Sesame	Peas (split peas) Lentils Beans Chickpeas	Wheat Rice Corn Barley Rye Oats