

## Soya bean composition and amino acid profiles

Soybeans are grown primarily for their protein content, and secondarily for their oil. But that is only the beginning of the story because processing of soybeans yields a number of other products as well.

In the main form of processing, or "crushing" as it is often called, the soybeans are cleaned, cracked, dehulled, and rolled into flakes. This ruptures the oil cells for efficient extraction. The "crude" oil is removed with solvents or screw presses, and after further processing the refined soybean oil goes into such products as margarine, salad dressings, and cooking oils.

After the oil is extracted, the flakes are toasted and ground to produce soybean meal, most of which is used as a high-protein component of animal feeds. However, some of it is also processed into products for human consumption. These include soy flour, soy protein concentrate, and soy protein isolate which can be incorporated into a wide range of food products. In recent years, we have learned that isoflavones and other phytochemicals found in the soybean meal portion have documented health benefits. These are now being extracted and marketed as nutraceuticals in functional foods.

The soy hulls removed in the initial crushing can be processed into fiber for use in breads, cereals and snacks. Lecithin, extracted from soybean oil, is used for everything from pharmaceuticals to protective coatings. It is a natural emulsifier and lubricant. Lecithin is used, for example, to keep the chocolate and cocoa butter in a candy bar from separating. Soybean oil is also a natural source of vitamin E. That portion of the vitamin E that is extracted as part of the refining process is recovered and marketed with other vitamin supplements. Nevertheless, refined soybean oil remains a good source of vitamin E.

### Essential amino acid composition of selected soybean ingredients (mg/100g protein)

Amino acid	Soya Bean	Soya Flour	Soya Concentrate	Soya Isolate	Soyamilk	Tofu
Isoleucine	35	46	48	49	46	48
Leucine	79	78	79	82	79	83
Lysine	62	64	64	64	60	61
Methionine & Cystine	21	26	28	26	16	14
Phenylalanine & Tyrosine	87	88	89	92	80	83
Threonine	41	39	45	38	40	40
Tryptohan	n/a	14	16	14	n/a	n/a
Valine	37	46	50	50	48	49

#### Soya Flour

**Protein: 39%**  
**Fat: 20%**  
**Fibre : 2.5%**  
**Ash: 7.2%**

#### Soya Isolate

**Protein: 80%**  
**Fat: 3.4%**  
**Fibre: 0.25%**  
**Carbohydrate: 7.4%**