

## AN OVERVIEW OF RAPESEED OIL AS A BIODIESEL FUEL

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Biodiesel, the non-toxic fuel, is biodegradable and environmentally benign fuel used in diesel engines. Biodiesel does not contain any sulphur or aromatic compounds and its combustion results in lower emission of carbon monoxides, hydrocarbons and particulates.

Biodiesel is produced from biological sources such as vegetable oils or animal fats using a biochemical process known as transesterification. Transesterification is the reaction by which fats or oils react with alcohols to form biodiesel esters and glycerol. A catalyst, alkaline, acidic or enzyme is employed to increase the reaction rate and yield.

The production of biodiesel starts with the choice of feedstock. The feedstocks for biodiesel production are primarily vegetable oils and animal fats. The residual fats and oils of domestic, commercial and industrial processing can also be used as feedstocks. Choosing the oils or fats for biodiesel production depends on both the process chemistry and economy of the process and most importantly the oil content of the feedstock. The oil content is of fundamental significance and, in the future, is likely to become the competitive factor on international markets.

Different vegetable oils with various compositions of fatty acids can be used for biodiesel production. Among them soybean, sunflower, rapeseed and palm are the most studied ones. Rapeseed oil is the preferred oil stock for biodiesel production in most of Europe.

Rapeseed oil is known as an important source of health-related compounds in the human diet. The high content of unsaturated fatty acids, particularly linolenic acid, results in a high nutritive value with beneficial health effects, e.g. blood pressure or lipid lowering actions. The main phenolic acids in rapeseed are sinapic acid and its derivatives, such as sinapolyglucose or sinapine, a choline ester of sinapic acid.