



Transition paths to sustainable legume-based systems in Europe

## Extrusion as a way to develop new legume products

New products based on legumes have to appeal to potential customers in the supermarket. Extrusion is very well suited for the development and production of such foods. Starch or protein containing foods with a moisture content of 15 to 35 % are used for extrusion. High temperatures and pressure expose the mixture to mechanical shear forces in the extruder. Under these conditions, the raw materials are converted into "viscoelastic melts" in a heated cylinder, which are then forced to flow through the die at the end of the extruder. Due to the pressure drop above the die and the subsequent conversion of high-temperature water into steam, the mixture expands drastically at the outlet and results in the desired expanded product.

By means of twin-screw extrusion, expanded products such as snacks or crispies (both with up to 75% protein) can be produced from all types of legumes. Crispies are an excellent basis for meat analogues. Pea flakes (60% protein) can be produced by planetary roller extrusion, which can be used like corn flakes in mueslis or eaten directly.

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During extrusion, all products can be mixed with flavour carriers such as spices, herbs or cocoa and sugar, or these products can also be coated. This combines the healthy properties with the good taste. With another type of extrusion, the pasta technology, pasta can be produced from the legumes. Spices/herbs for different flavours can also be added, e.g. a lentil noodle with curry.



AMINO-Crispies, -Flakes, -Nuggets and -Pasta. Photo credits ©: Institut für Getreideverarbeitung (IGV)



### About TRUE

The EU funded project "TRansition paths to sUustainable legume based systems in Europe" (TRUE) is a balanced practice-research partnership of 24 institutions, which aims to identify the best routes, or "transition paths" to **increase sustainable legume cultivation and consumption across Europe** and includes the entire legume feed and food value chains.

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