



Transition paths to sustainable legume-based systems in Europe

Development and processing of protein rich vegetable foods

Legumes are extremely useful for high protein products such as pasta, snacks and so-called meat analogues (products that are similar to meat, but suitable for vegetarian or vegan consumers). The main technology used and suitable for various applications in this field, is called extrusion.

During extrusion, starchy or proteinaceous foods with moisture content ranging from 15 to 35% are subjected to high temperature, high pressure and intensive mechanical shear forces. Under these conditions, the biopolymer-based raw materials are converted in a heated barrel into 'viscoelastic melts', which are further forced to flow through a die. Due to the pressure drop across the die and the subsequent conversion of high-temperature water to steam, the molten stream at the exit expands dramatically to give the desired expanded/cooked 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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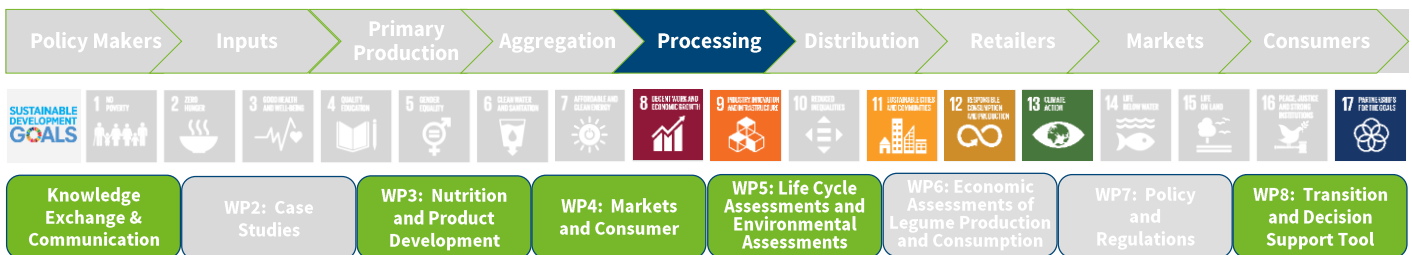
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All Practice Abstracts prepared by the TRUE Project in the EIP-Agri common format can be found here: <https://ec.europa.eu/eip/agriculture/en/find-connect/projects/transition-paths-sustainable-legume-based-systems>





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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 "TTransition 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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