



## MALIK'S ..... The Extrusion Experts

### Technical Article (Producing Soy texturized protein nugget through Extrusion)



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Textured vegetable protein, also known as TVP, is a manufactured [soy](#) product. The generic name is Total Soy Protein, or TSP, which is actually a more accurate description since it contains a derivative of soybeans rather than actual vegetables. TVP is a trademarked brand name that has become the frequent identifier.

Raw Soybeans cannot be used for human consumption directly since it contains several anti nutritional factors. However, most of these can be avoided and inhibited, when processed at high temperatures. Since Extruder is a Bio Reactor, the soybeans processed on HTST (High Temperature Short Residence Extruder) is best and suitable to produce light weight Nugget protein (TVP) obtained from defatted or degermed Soybeans.

TVP is frequently used as a meat replacement, or in some cases, a meat extender. It has a texture that resembles ground chicken meat, so it's an ideal meat substitute in natural meat dishes. TVP can also be used as an additive in meat dishes to help a little meat go a long way. It's commonly found in the cafeterias of institutions with limited financial resources, such as schools and charity org.

#### **How TVP is Made:**

TVP is a factory-made food that originates from a soy protein isolate. The process involves separating the protein from the whole soybean. After extraction of germ or oil the remnant is crushed to suitable grits to get defatted soy flour/grits. Commercially, few additives are included along with some proportion of water. The moisturized grits

are then processed on HTST Extruder which completely cooks the products while transporting and pumping the cooked plastic mass through a circular die, many times smaller than the final dimensions of product. The superheated water flashes off the mixture, as steam, thus superficially expanding the product to get characteristic Ball shape, though square cubes could also result using a suitable die. At the die, a cutter continuously cuts the plastic rod into smaller lengths. The result is TVP.

A big consideration in a vegetarian diet is getting enough protein, and soy is beneficial as a complete protein, which means it has all of the essential amino acids your body needs. TVP is a soy protein that is also low in calories, carbohydrates and fat, which is always a bonus, especially for weight watchers. People like cooking with TVP because it doesn't have much of a flavor of its own, so it tends to take on the flavors of the ingredients it's being cooked.

### **Processing Soy TVP or Nugget:**

The process starts from obtaining defatted Soy grits. It is mixed in a Slow speed Ribbon or Paddle Mixer, with water and other ingredients (baking soda aids in texture and expansion).

Next, the Premixed Raw-materials are shifted to a HTST Extruder which is equipped with heated Barrel Tube (this being generally made up of several segments for easy cleaning) and a special Archimedean spiral screw which rotates at high speed for 1) providing maximum shear and 2) less residence time in barrel tube. Temperatures controlled upto 150 Deg Celsius, to prevent decomposition and provide required degree of cooking.

The high temperatures kill the bacteria- good for hygiene. Additionally, and more important, the harmful factors are denatured and harmful effects inhibited due to tempered Extrusion.

Water in the mix held inside Extruder, as superheated steam. Further transport through die exit puffs or expands the product to get light weight TVP Nugget protein. Excess Moisture is removed in a Drier which moves the wet product over a single, or Multiple Belt(s) in Hot Air Environment. The Dry TVP contains no more than 2-3% water. Good for long shelf life and inhibit mould growth.



**EXTRUDER MESEB(HS)-200 (200Kg/Hour capacity Soy Nugget, Single screw)**



**MEGA-TCX-80 Upto 1 TPH Cap.  
(Twin Screw with Preconditioner & Live Bin)**



**MEFEMS (500 KPH)  
(Single Screw with Live Bin)**



For more information, please contact:

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