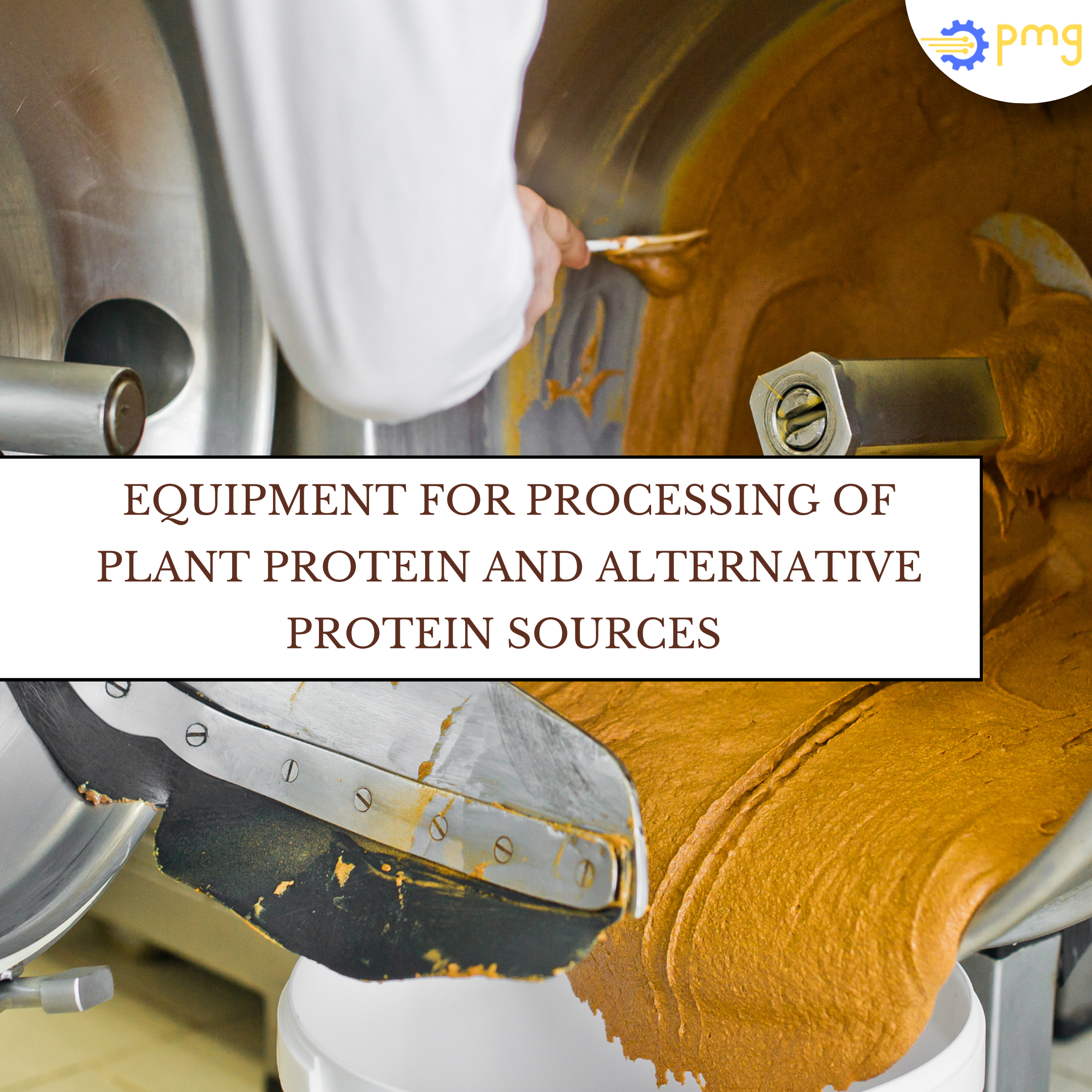


The background image shows a food processing facility. In the upper half, a person in a white lab coat is using a metal spoon to stir a thick, orange-brown paste inside a large stainless steel mixing bowl. In the lower half, a large metal scraper is shown scraping the same paste from the side of a rotating drum, which is positioned over a white collection bin. The paste has a smooth, slightly textured appearance.

EQUIPMENT FOR PROCESSING OF PLANT PROTEIN AND ALTERNATIVE PROTEIN SOURCES

The equipment for processing of plant and alternative protein sources varies depending on the specific type of plant or alternative protein being processed, as well as the desired end product. Here are some examples of equipment commonly used in the processing of plant and alternative protein sources:

- 1. Extruders:** Extruders are commonly used in the processing of plant-based proteins such as soy, pea, and rice. The extrusion process involves heating and pressurizing a mixture of protein, starch, and other ingredients, which can then be formed into a variety of shapes and textures.
- 2. Blenders and mixers:** Blenders and mixers are used to mix and homogenize ingredients in the production of plant-based protein powders and blends.
- 3. Separators and filters:** Separators and filters are used to separate solid and liquid components in the production of plant-based protein extracts and concentrates.
- 4. Fermenters:** Fermenters are used in the production of alternative protein sources such as microbial and fungal proteins. The fermentation process involves culturing microorganisms such as yeast or bacteria to produce proteins, which can then be harvested and purified.
- 5. Centrifuges:** Centrifuges are used in the purification of plant-based protein extracts and concentrates. The centrifugation process involves separating protein from other components such as fibers and carbohydrates.
- 6. Homogenizers:** Homogenizers are used to break down plant-based proteins into smaller particles, improving their functional properties such as solubility and emulsification.

VARIETY OF FOOD PRODUCTS THAT CAN BE PROCESSED USING EQUIPMENT:

1. Plant-based meat substitutes:

Extruders, mixers, and blenders are used to create plant-based meat substitutes like burgers, sausages, and nuggets from ingredients like soy, wheat, peas, and mushrooms.

2. Nut and seed milks:

Almond, cashew, and other nut and seed milks are made using specialized equipment like nut milk bags, blenders, and strainers.

3. Tofu and tempeh:

Soy-based products like tofu and tempeh are made using equipment like soy milk makers, tofu presses, and incubators.

4. Protein powders:

Protein powders made from plant-based sources like pea, rice, and hemp are created using equipment like blenders, mixers, and sifters.

5. Protein bars:

Equipment such as mixers, blenders, and presses are used to create protein bars made from ingredients like nuts, seeds, and plant-based protein powders.

6. Plant-based cheeses:

Equipment like blenders, mixers, and fermentation chambers are used to create plant-based cheeses made from ingredients like nuts, seeds, and tofu.



General working principles:

- 1. Grinding and milling:** Often done with machines like grinders or mills that use blades or burrs to break down the ingredients into a fine powder.
- 2. Mixing and blending:** Mixing and blending are used to combine ingredients and create a homogeneous mixture. This is often done using machines like blenders or mixers that can blend ingredients together.
- 3. Extrusion:** Extrusion is a process in which a mixture of ingredients is forced through a die to create a specific shape or texture. Extruders are commonly used to create plant-based meat substitutes, as well as snacks and cereals.
- 4. Fermentation:** Fermentation is a process in which microorganisms are used to break down and transform ingredients. This is commonly used in the production of plant-based cheeses and yogurts.
- 5. Drying:** Drying is used to remove moisture from ingredients or finished products. This is often done using machines like dehydrators or ovens.
- 6. Pressing:** Pressing is used to remove excess moisture or to shape ingredients into a specific form. This is commonly used in the production of tofu and tempeh.

THE MARKET FOR EQUIPMENT USED IN THE PROCESSING OF PLANT AND ALTERNATIVE PROTEIN SOURCES IS EXPECTED TO GROW SIGNIFICANTLY IN THE COMING YEARS DUE TO INCREASING DEMAND FOR PLANT-BASED FOODS AND ALTERNATIVE PROTEIN SOURCES. ACCORDING TO A REPORT BY METICULOUS RESEARCH, THE GLOBAL PLANT-BASED PROTEIN MARKET IS EXPECTED TO GROW AT A CAGR OF 8.1% FROM 2021 TO 2028. EQUIPMENT USED IN THE PRODUCTION OF PLANT-BASED MEAT SUBSTITUTES, SUCH AS EXTRUDERS, MIXERS, AND BLENDERS, ARE THEREFORE IN HIGH DEMAND.

Key players in the market:

GEA Group AG, Alfa Laval AB, Bühler Group.