

# UNITED STATES PATENT OFFICE

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## PROCESS OF MAKING A FOOD PRODUCT

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This invention relates to foods and the process of making the same from citrus fruit waste such as the peel, rag and seed of citrus fruits. It is therefore an object of this invention to prepare a product from citrus fruit peel and/or rag and/or seed which is suitable as a foodstuff for humans and as a cattle feed.

A further object of my invention is to prepare a new and valuable food product from cull citrus fruit and by-products comprising peel, rag and seed discarded by citrus fruit canneries.

Another object is to provide a process for the removal of water and objectionable taste from these citrus materials economically and efficiently.

A further object is to provide a continuous process for producing stock food having the desired feeding properties from citrus fruit materials without expensive equipment or extensive technical control.

A further object is to chemically treat citrus materials to expedite the removal of water therefrom and to eliminate objectionable odors and tastes from the finished food product.

It is therefore an object of this invention chemically to treat citrus wastes and remove a controlled amount of water together with the constituents causing objectionable odor and taste, thus producing a new palatable foodstuff of delightful fruit odor and taste and possessed of unusual nutritive qualities.

In the canning of grapefruit hearts and grapefruit or orange juice there results by-products consisting of peel, rag, seed, residual juice and sometimes considerable quantities of water. The normal waste is slick and contains 80% to 85% moisture but may contain as high as 95% and under the prior art practice it is not adaptable to commercial processing. Consequently the citrus wastes have been discarded but even the disposal has been disagreeable, expensive, and difficult.

Various methods have been suggested for the utilization of this waste material but none has proven economical or efficient. For example, attempts have been made to use the green, i. e., unprocessed, citrus wastes as a fertilizer. Citrus fruit refuse, however, is low in plant food content and high in water content. The water very slowly is released to the soil and air as the solids undergo decomposition with an offensive odor. The decomposition constitutes a health hazard in providing an attraction and a suitable environment for the propagation of flies, gnats, and the like. Even when the wastes will have disinte-

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grated there will be but little or no benefit to the land.

Efforts have also been made to convert citrus refuse into a feed for cattle. One practice in the past has been to grind the green untreated citrus wastes and ship the material with its high water content to dairies to be used as feed. This procedure, however, is unsatisfactory from both the cost and feeding standpoints. The large amount of water that must be transported results in excessive transportation costs and further, the green, unprocessed citrus waste decomposes rapidly. Even when the unprocessed fresh citrus wastes are fed to dairy cattle near the cannery and thus eliminating or reducing the transportation costs, there is a more serious objection. When the unprocessed citrus wastes are fed to dairy cattle, the milk has a very disagreeable flavor due to the essential oil and bitter flavor content, for example, naringin, of the citrus material. Likewise, it has been found that this disagreeable flavor is present in the meat of beef cattle fed on unprocessed citrus wastes. Under my invention, however, the green or dry chemically treated citrus materials may be fed to great advantage without flavoring the milk or meat.

In the prior art processes where the citrus peel, rag and seed have been ground, shredded, or crushed, the water cannot be removed economically from the unprocessed pulp. Many efforts have been made to press or mechanically dewater the citrus wastes so that it may be more readily dried or handled green as a feed. It has been found, however, that the only moisture successfully extracted has been the free water and juices of the fruit that may be contained in the waste material from the canneries. Therefore, during the subsequent drying operation, the moisture and acids not removed mechanically react with other constituents forming undesirable intermediate products which retard the water removal. The presence of these rubbery, gummy substances prevents rapid drying of the material and greatly increases the cost of drying.

This invention provides a process wherein these difficulties are overcome by chemically treating the cannery wastes before the pressing and drying steps. The chemical treatment of the citrus waste results in a watery liquid and a pressable pulp which are easily separable by filtration or by a screw press, for example. The chemical agents added neutralize the acids and consequently there is no tendency to form undesirable products to interfere with the drying step. The objectionable flavoring constituents of the