

UNITED STATES PATENT OFFICE

2,566,549

ANIMAL FEEDSTUFF

Gertrude H. Beckwith and James L. Sutherland,
San Pedro, Calif., assignors to Philip R. Park,
Inc., Outer Harbor, San Pedro, Calif., a corporation of California

No Drawing. Application July 9, 1949,
Serial No. 103,942

34 Claims. (Cl. 99—2)

1

This invention relates to feedstuffs, and more particularly to concentrated animal feeding materials derived especially from fish and also from other sources supplying proteinaceous substances in concentrated form.

An important object of this invention is to produce, without application of heat, a dry, proteinaceous feedstuff from proteinaceous concentrates which are conveniently producible commercially only in a very wet condition as a semi-solid or slurry, such as the so-called "fish solubles" and "fish glandular hydrolysates" derived as by-products of the fish industry and herein designated as "condensed fish concentrates" or "fish-soluble concentrates."

The fish industry now supplies by-product concentrates which were formerly wasted by discarding the press liquor or "stick" resulting from the pressing of various types of fish in the preparation of fish meal for feeding and other purposes. Formerly, the disposition of this waste press liquor constituted a serious problem because of nauseating odors developing from fermentation, and because of water pollution from discharge into streams, bays, and harbors. More recently it has been found that these fish press liquors actually contain large proportions of valuable food ingredients including coagulable proteins, noncoagulable proteins in solution or suspension therein, dissolved mineral salts, and various vitamins. By coagulating the coagulable proteins and concentrating the liquors, with or without removing the coagulated proteins, it has been found that a very valuable feedstuff is obtained. Ordinarily, the coagulated material is not removed and the concentrated product is a semi-solid or slurry which contains in the order of 50% of water, but it may contain considerably less water, such as 25% water, or appreciably more. It is one of the materials commonly known and referred to hereinafter as "fish solubles" or "fish-soluble concentrate," or "condensed fish solubles." Similar materials to be included within the general term "fish concentrates" for the purpose of this specification are fish liver concentrates and the like, and those known as "fish glandular hydrolysates." The latter are glandular fish extracts which have been digested by enzymatic digestion, that is, with proteolytic enzymes, to preserve their amino acid content, although fish protein hydrolysates which have been digested with acid (such as hydrochloric acid) are within the scope of the present invention, although they are not so desirable because of the effect of the digesting acid upon the amino acids. These ex-

2

tracts and the described fish solubles are those included in the term "condensed fish concentrates," as previously indicated.

As has been above indicated, when "fish solubles" or "fish-soluble concentrates" are obtained in their usual concentrated form, they contain considerable water. One object of this invention is to prepare a feedstuff from such fish protein concentrates having high water content so that the product shall be dry and may be readily handled, and also that such dry product may, if desired, be mixed with other dry proteinaceous solid materials such as fish meal, animal meal (often referred to as "meat scraps"), vegetable protein meals such as soy bean meal, and the like.

It is a further object of the invention to prepare the above-mentioned water-containing fish concentrates with agents which not only serve to yield a dry product but which, at the same time, serve to supply a valuable dietary constituent. Such agents are represented notably by hydratable phosphates capable of taking up several molecules of water as water of crystallization.

In practicing the present invention, any of the above-described fish concentrates in wet form obtained from press liquor or other source by any usual or preferred concentrating method, are combined in some appropriate manner with a quantity of edible phosphates capable of taking up as water of crystallization that proportion of the water of the concentrate necessary to yield a sufficiently dry product. For example, a product may be considered sufficiently dry when it contains only 10% or 12% of moisture, but more moisture, for example 15%, or less moisture, for example 5%, may be in order for different purposes, or for different conditions of storage. Thus, a wet fish-soluble concentrate containing both dissolved and undissolved solids such as salts, vitamins, coagulated proteins, and uncoagulated proteins, in the presence of 40% to 60% of water, for example, will have added thereto, or supplied thereto in any other appropriate manner, an edible phosphate salt which will combine with a required proportion of the water to yield hydrated phosphates containing such desired proportion of water as water of crystallization. Two particularly desirable, edible phosphates are disodium phosphate (Na_2HPO_4) and calcium ammonium phosphate, which exists as a heptahydrate.



In view of its nature, the calcium ammonium phosphate is formed in situ as presently to be described. In employing the disodium phosphate,