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**ANIMAL HUSBANDRY METHOD AND
FEEDSTUFF**

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This invention relates to improved methods in animal husbandry and to nutritionally and therapeutically beneficial animal feedstuffs containing one or more of the substances identified by the arbitrary names Phytoactin and Phytostreptin, now known by the non-proprietary names of "polyamidohygrostreptin" and "polyaminohygrostreptin," respectively.

Previously, it was known to incorporate antibacterial substances such as penicillin, bacitracin, aureomycin, and tetracycline compounds in otherwise nutritionally adequate animal diets for nutritional and therapeutic purposes. It has also been found that the response of the animal to such substances varies, and many compounds having antibacterial activity produce little or no practical benefit.

The invention is concerned with the surprising discovery that the primarily antifungal substances polyamidohygrostreptin (Phytoactin) and polyaminohygrostreptin (Phytostreptin), are both nutritionally and therapeutically beneficial when administered to animals. These substances are very effectively administered by incorporation in the animal diet, such as in solid or liquid components of or supplements to the diet.

Proceeding according to the invention, one or more of the substances Phytoactin and Phytostreptin is administered to animals in an amount sufficient to produce a nutritional or therapeutic response. The substances are advantageously incorporated in the animal diet, such as in the drinking water, or in liquid or solid components of the feed. The substances are administered in a proportion which is preferably equivalent to about 1 to 500 grams per ton of solid feed consumed by the animals. Thus, the substances may be incorporated in one or more of the materials to be ingested by the animals, preferably so that they are supplied to the animals daily at about the foregoing average rate.

It has been found that Phytoactin or Phytostreptin may often be supplied at an average rate of about 1 to 50 grams per ton to produce a maximum growth response. Somewhat higher levels may be desirable for therapeutic purposes, in the range of about 10 to 200 grams per ton of solid feed consumption. The higher levels are preferred when both nutritional and therapeutic responses are desired.

The administration of Phytoactin or Phytostreptin according to the invention has been found to produce greater weight gains in poultry, and often with a better feed efficiency. Consequently, the animals are brought to marketable weight in a shorter period of time. Therapeutic benefits are also obtained in combatting illness and reducing mortality.

Phytoactin and Phytostreptin may be employed in the form of the products obtained in their production by fermentation, in the form of a concentrate thereof, or as substantially pure material. Thus, for example, a fermentation product may be dried, and the dried fermentation whole culture may be administered as such to the animals. Alternatively, products which have been partially purified and concentrated further may be employed, such as dried filtered fermentation product, and dried solvent extracts. The materials may be admixed directly with the solid or liquid components of the diet.

In a preferred embodiment of the invention, Phytoactin or Phytostreptin may be incorporated at the rate of about 1 to 500 grams per ton of feed, in an otherwise nutrition-

ally adequate animal feed. The feed is predominantly vegetable matter, together with various animal products, minerals, vitamins and other substances which provide a nutritionally adequate feedstuff.

In another preferred embodiment, Phytoactin or Phytostreptin may be admixed with a pharmacologically acceptable material, preferably an animal feed material which contributes to nutrition, to provide a concentrate having a standardized level of active substance. Thus, for example, vegetable components of the feed may be admixed with Phytoactin or Phytostreptin. Such concentrates preferably contain about 1 to 100 grams of Phytoactin or Phytostreptin per pound of the mixture, and they are adapted for use as additives or supplements to materials constituting the principal proportion of the animal ration. Other nutrient materials which may be blended with the active products include soya products, starch, fish meal, distillery by-products, brewery by-products, sugars, minerals and the like, and vitamins such as vitamin B₁₂, amino acids, and other growth-promoting factors.

The Phytoactin and Phytostreptin products may be admixed with liquid nutritional animal feed materials, either as they are supplied to the animals or in the form of concentrates to be subsequently diluted for feeding.

Instead of incorporating the active substances in such materials as the foregoing which are designed to supply the nutritional requirements of the animals, it is possible to incorporate them in the drinking water. The substances are administered in this manner at a concentration of about 1 to 200 p.p.m. In such case, it may be advantageous to include a pharmacologically acceptable suspending or dispersing agent when fermentation products or concentrates are employed. It may also be preferable to incorporate such an agent when employing Phytoactin, which is slightly soluble in water, producing an homogeneous colloidal solution. Phytostreptin is water-soluble.

In this manner, the invention provides valuable improvements in animal nutrition and therapy. The invention is especially useful in poultry husbandry, and it is also contemplated that the invention be applied to other non-ruminants such as swine. The following examples illustrate beneficial results which may be obtained by the administration of Phytoactin and Phytostreptin. It is to be understood that the invention is not limited to the examples or to the materials, proportions, conditions and procedures set forth therein.

EXAMPLE 1

A chick feeding trial was conducted in batteries wherein day-old Cornish-Arbor Acre Cross hatchery run chicks were divided into four groups of approximately equal average weight, 30 chickens per group, with one group receiving only the predominantly vegetable basal chick ration (Table I), and the remaining groups receiving the basal ration supplemented with three levels of purified Phytoactin. The data at the end of 8 weeks are given in Table II.

Table I

	Ingredients, percent by weight
Ground yellow corn	48.9.
Soybean oil meal, 44%	25.
Corn gluten meal	5.
Stabilized animal tallow	10.
Dried brewers' yeast	4.
Condensed fish solubles	3.
Limestone	1.25.
Alfalfa leaf meal, 17%	1.
Steamed bone meal	1.
Iodized salt	0.5.