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IMPROVEMENT OF COMPLEX COTTON OIL REFINING TECHNOLOGY

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Abstract
This article comprehensively examines the economic repercussions resulting from the decrease in cotton cultivation in the Republic, particularly the subsequent reduction in processed seed production and its cascading effects on oil product availability. The decline has led to challenges in meeting local demand, necessitating the importation of oil products and soybeans, causing financial strain due to heightened reliance on foreign supplies and resultant price inflation. To address these challenges, the article highlights a strategic shift towards cultivating alternative oil crops better suited to the region's climate. However, the processing of these oilseeds predominantly occurs in smaller, specialized enterprises, posing operational difficulties for larger, less adaptable oil plants. A critical focus of the article revolves around the pressing need for advanced refining methodologies for crude oils. The current industry-standard practices, notably inefficient in purifying oils derived from lower-quality seeds, heavily rely on high-concentration alkali, resulting in substantial losses and increased production costs.
Keywords: Oilseed Processing, Cotton Cultivation, Processed Seed, Oil Product Shortage, Import Dependency, Alternative Oil Crops, Economic Impact, Technological Innovation, Refining Methods, Gossypol Derivatives.

Introduction

In recent years, as the area under cotton cultivation has decreased, the amount of processed seed has also decreased. As a result, the level of providing the population with oil products decreased, and due to the lack of raw materials, the technical and economic indicators of enterprises decreased significantly. Oil products and soybeans are imported from abroad to solve this problem.

A large amount of foreign currency is spent on this, and because of this, the prices of products are high. Based on the above conditions, the planting of oil crops such as flax, sesame, sorghum, soybean, rapeseed, which are effective in our climate, is being increased. Collected oilseeds are mainly processed in small enterprises specialized in cotton seed processing or not well equipped with production technologies. Large oil plants are not technically adapted to process these oilseeds, and even if adapted, losses and costs are high due to lack of adequate

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processing technologies. Therefore, it is important to create efficient, easy-to-use methods for refining crude oils.

Currently, the refining methods used in the industry show a decrease in efficiency (up to 80-85%) in the purification of oils obtained from low-quality oilseeds. The main reason for this is the use of high-concentration alkali in large quantities (up to 18 kg/t) to obtain dense structured soap stock. If technologies are developed that improve the adsorption of gossypol derivatives on soapstock particles, which can easily separate the soapstock, losses can be significantly reduced.

The oil industry produces oils and fats for direct consumption, for the preparation of margarine products, for the preparation of mayonnaise, hydrogenated oils, soap, glycerin, fatty acids, olive oil and other products. The complete cycle of refining includes separation of phospholipids, waxy substances, free fatty acids, dyes and odorants.

Various methods are used for this purpose, and the basis of these methods is the selectivity of certain reagents for certain substances. This mainly includes the separation of phospholipids by hydration through water or aqueous solutions of electrolytes, the separation of free fatty acids in the form of sodium salts of fats, the separation of colored substances-pigments by means of sorbents, and the separation of odor and taste substances by deodorization. When choosing a technological mode of refining each type of oil, it is necessary to take into account its specific characteristics.

In order for the refining process to be effective, the following requirements are set: leaving the glyceride part of the oil completely unchanged; maintain their suitability for consumption; reduce losses and waste. Optimum conditions for the oil refining process are of great importance in positively solving these problems, that is, the amount of sodium hydroxide, its concentration, the temperature of the neutralization process, the mixing speed, etc.

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