CRIG has begun investigation into the utilization of Shea pulp and Shea butter due to limited use of these materials. The under-listed products have so far been developed.

**Products from Shea Pulp**

**Jam and Wine**
The pulp has successfully been used to develop jam as well as wine, gin and brandy.

**Products from Shea Kernels**

**Shea Butter Soap, Pomade, Cream, Lotion**
The butter from kernel has also been used for the development of toilet soap, body cream and pomade.

**Local Soft Soap (Alata Samina)**
Shea butter has been used to enhance the moisturizing effect of the local soft soap (Alata Samina).

**Cashew By-products**
Apart from cocoa and shea, CRIG has successfully developed useful products from the apple and nut of cashew fruits. The institute has so far produced the following items:

**Products from Cashew Apple Juice**

**Wine and vinegar**
Just as in cocoa wine, wine and vinegar have also been produced from cashew apple juice.

**Industrial alcohol gin and brandy**
Gin and Brandy have also been blended from alcohol distilled from fermented cashew apple juice.

**Jam, marmalade and fresh drink**
Products such as jams and marmalades have been developed from cashew apple juice using pectin extracted from lemon. Fresh apple juice is also pasteurized and bottled as a ready-to-serve drink.

**Products From Cashew Pulp**

**Animal feed**
After the extraction of cashew juice from the apples, the residues are dried and may be fed to animals forming 25% of dry season supplement for cattle and 20% of a complete feed for pigs.

**Products from cashew nut shell**

**Preservative and Briquette**
Cashew nut shell liquid (CNSL) has been extracted from the shells of cashew nut and has been used effectively for wood preservation against termites. The shells have been used to develop briquette for use as fuel.

**Products From Cashew Kernels**

**Cashew nuts and cashew nut butter**
Raw cashew kernels removed from nuts have been roasted and packaged a snack or milled into paste and packaged as cashew nut butter. The cashew butter is found to serve a better alternative to traditional groundnut paste.

**Animal feed**
Cashew kernels rejected during processing of nuts because they are broken or oily have found use in feeding of pigs (30%) and broilers (15%).

For further enquiries, please contact:
The Executive Director
Cocoa Research Institute of Ghana (CRIG)
P. O. Box 8
New Tafo Akim, Ghana
Or
Kotoka International Airport
Private Mail Bag
Accra, Ghana
Tel: 0544331090/ 0544331092
Fax: 0277900029
Website: crig.org.gh
E-mail: crigmail.org@yahoo.com/crig@crig.org.gh
At its inception in June 1938, the Tafo Central Cocoa Research Station was assigned clear goals within the Gold Coast Department of Agriculture: to investigate the pest and disease problems of cocoa in order to maintain production in the Eastern Region.

In 1944 when the Research Station was upgraded to WACRI, the objectives were widened to include investigations into the disease and pest problems of cocoa in West Africa, soil fertility and good agricultural practices, with the view to increasing yield. Since 1966, CRIG research mandate has been widened to include coffee, kola, sheanut and more recently cashew.

CRIG also conducts research into the development of by-products of cocoa and other mandated crops with the aim of diversifying utilization and to generate additional income for farmers.

**Mission**

The mission of the institute is to be a centre of excellence for developing sustainable, demand-driven, commercially-oriented, cost-effective, socially and environmentally acceptable technologies which will enable stakeholders to realize the overall vision of the cocoa industry and the other mandated crops (coffee, kola, shea and cashew).

**Research Management**

The Institute has six research divisions and two units: Agronomy, Soil Science, Entomology, Plant Breeding, Plant Pathology and Physiology/Biochemistry Division. The units are Social Science and Statistics and New Products Development Units.

Research is organized on the basis of a multi-disciplinary thrust system. The different thrusts are Cocoa Establishment, Cocoa Improvement, Cocoa Insects Management, Cocoa Swollen Shoot Virus Disease, Cocoa Fungal Diseases Management and New Products Development. In addition, there are several coffee, kola and sheanut/cashew thrusts.

**Mandate**

Interest in the development and utilization of cocoa by-products from fresh pod and farm waste dates back to the inception of the institute. The institute has so far produced the following items:

**Animal feed**

Cocoa pod husks (CPH) have been processed into animal feed by a process of slicing, partial drying, and pelleting into granules. The dried pellets are used in animal feed formulations. Feeding trials have been conducted on sheep, pigs and poultry by CRIG in collaboration with the Animal Research Institute (ARI), Accra and the Animal Science Department of the University of Science and Technology KNUST, Kumasi.

Nutrient composition of CPH feed on dry basis is as follows:

- Crude protein: 6.5%
- Crude fiber: 27%
- Ash: 8.0%
- Ether extract: 4.4%
- Nitrogen: 43.0%
- Others: 11.1%

Recommended quantities of CPH (on dry weight basis) for feed formulation are as follows:

- Sheep up to 60% optimum is 45%
- Pigs up to 32.5% optimum level is 25%
- Poultry maximum of 10%

**Potash**

This is a product from the burnt dry cocoa pod husk. It is the main source of alkali used by the local soap industry for production of:

- Local Soft Soap (Alata Samina)
- Potash fertilizer

**Products From Cocoa Pod Husk (CPH)**

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**Products from Cocoa Pulp Juice (Sweating)**

**Fresh drink**

Pressing beans from freshly ripe harvested cocoa pods has produced this refreshing drink from cocoa pulp juice. The juice is pasteurized and therefore contains all its natural flavours. It is served best when chilled.

**Pectin**

This is a product obtained from fresh cocoa juice (sweatings). It is used in confectionery, food and pharmaceutical industries as a gelling agent.

**Jam**

Cocoa pulp juice in its natural state contains some amount of sugar and pectin. Jam of acceptable quality and consistency is produced from the pulp juice.

**Wine**

Cocoa wine is produced from the pulp juice when pasteurized and fermented with wine yeast.

**Vinegar**

Wine from the pulp juice is converted to vinegar using acetic acid bacteria fermentation.

**Gin/Brandy**

Alcohol is produced from the pulp juice after fermentation and distillation. The alcohol produced is then blended to the acceptable concentration as gin or brandy.

**Products From Cocoa Beans**

**Moisturizing Cocoa Butter Soap**

The butter from discarded beans (slaty, germinated, diseased and small, size beans) has been systematically researched into and formulated with other vegetable oils to produce cocoa butter based soap of acceptable quality.

**Body Pomade and Cream**

These products have been carefully formulated with cocoa butter.