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Science, Technology, Research and Innovation for Development (STRIDE)



Optimization of Cacao Fermentation

GRANTEE: Ateneo de Davao University (ADDU)

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INDUSTRY PARTNER: Subasta Integrated Farmers Multi-Purpose Cooperative

COLLABORATING PARTNER: Ateneo de Zamboanga University

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Producing better chocolates

The high demand for cacao in the world market, from the increase in popularity of cacao and chocolate products, triggered intensive cacao farming in Asia. In the Philippines, for instance, more farmers in Davao and Zamboanga shifted to cacao production. This development provides better opportunities for cacao farmers to increase their yield by becoming major players and contributors in the cacao industry. However, an increase in yield does not automatically translate to an increase in income. Equally important to quality and quantity of produce is the postharvest product, particularly the fermented beans.



The research team conducts chemical analysis of cacao beans

Cacao fermentation is an important aspect to improve chocolate flavor and nutritional value. The majority of farmers; however, are not aware of the importance of fermentation and are not knowledgeable of appropriate fermentation processes. Improper fermentation results in inconsistent quality, lower bean count, and a lack of some essential traits of chocolate products, which makes them less appealing to chocolate industries and consumers.

To cope up with the demand for fermented cacao without sacrificing quality and to help farmers optimize their yield, ADDU, with support from USAID STRIDE and in collaboration with Ateneo de Zamboanga University and Subasta Integrated Farmers Multi-Purpose Cooperative, developed a customized fermentation procedure.

Findings

- Six days of fermentation produces better quality and a greater number of fermented beans, which is contrary to the orthodox style that adopts a five-day fermentation. This finding was confirmed by the count test. Thus, a longer fermentation period increases bean count and improves quality;
- Beans with bigger size need longer fermentation time;
- The quality of inferior beans can be enhanced through fermentation;
- Higher temperature indicates better action of the fermenting microbe, thus the faster the ideal temperature is attained, the faster the fermentation process is completed;
- Stopping fermentation on the 6th day prevents other microbes or spore-forming bacteria to dwell on the beans;
- An increase in theobromine content or a conversion of caffeine to theobromine takes place during roasting of cocoa beans, and this as well results in enhanced bean flavor; and
- A fermentation process that allows three-hours of sunlight exposure prior to placing the beans into the sweatboxes, turned every other day, results in superior bean quality that qualifies for commercial use.

The project has built the technological capacity of both the research group and the farmers' cooperative. The establishment and adoption of standard scientific approaches will provide cacao farmers an edge in the chocolate business, thereby elevating the status of cocoa industry in the country.



Workers prepare cacao beans for fermentation