



PREVENTION OF PAH CONTAMINATION OF COCOA

Looking at the source of contamination of cocoa beans and preventive measures

Cocoa farmers and producers, exporters, processors, local authorities and the marketing industry can all benefit from the results of this project set up to raise awareness, and also help prevent PAH contamination.

In 2004 and 2005 the European Union set maximum limits for levels of Benzo(a)pyrene (BaP), a PAH, in oils and fats intended for direct human consumption or as an ingredient of food products. It was agreed that no limit would be set for cocoa butter subject to levels in cocoa butter being further investigated.

A PAH is an organic compound containing only hydrogen and carbon. Benzo(a)pyrene is a PAH. It is a pollutant and carcinogen. It can be found in coal tar (after a forest fire), after eruption of volcanoes, in cigarette smoke, and in burnt foods such as coffee. Evidence exists to link benzo[a]pyrene to the formation of lung cancer.

Initial investigations indicated that cocoa butter from certain origins had higher levels of PAH. Research was conducted based on this information, using B(a)P as the marker for PAH. This was carried out taking into account the differing environmental conditions and post-harvest practices in different producer countries. Four producing countries were targeted: Brazil, Cameroon, Ghana and Indonesia.

The project had two main objectives:

1. To identify, confirm and explain the sources of PAH contamination in the cocoa bean supply chain.
2. The development of practical measures to prevent PAH contamination adapted to specific country conditions and practices and which are also compatible with other preventative measures.

Almost five hundred samples from targeted areas were collected and analysed. Experiments were also set up to deliberately contaminate beans which were also analysed.

The project results show that the principal source for PAH in cocoa is smoke contamination of beans during artificial drying. This implies that:

- Good drying and storage practices are essential.
- Artificial driers must be properly functioning and well maintained.



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- It was also found that the edible nib is well protected from PAH contamination by the outer surface of the bean. The removal of the shell fraction during processing should be carefully carried out.

*The nib is the
edible part of the
cocoa bean.*

The second phase of the project enabled large numbers of producers and institutional bodies to be aware of the problems concerning PAH contamination, as well as measures needed to prevent contamination. Producers and institutions were in turn trained to become facilitators in further spreading of information to colleagues and associates. Workshops were organized in the four producing countries to distribute relevant educational materials. In addition, educational and research material was shared with many stakeholders in the cocoa industry and with the European Union Authorities.

All information is available free of charge on request.

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