

ABSTRACT

A series of experiments have been carried out in a laboratory scale packed bed drier in order to

- a) Investigate the mechanisms of moisture movement in the drying of cocoa bean
- b) Determine the drying characteristics of cocoa beans in packed beds.

The first series of experiments were carried out using a single layer of beans only. ~~These~~ drying periods were found, the first one representing a complex situation where the rate of heat transfer to the beans controlled the rate of drying. The second period correspond to the removal of liquid moisture from the passages inside the bean and the third period to the removal of moisture from the nib itself. These last two periods were found to be diffusion controlled processes.

In the section on the drying in a packed bed of beans, a series of experiments were carried out at different air flow rates and bed depths at the maximum temperature consistent with the desired biochemical changes within the bean. Only two periods showed up in the drying curve in this case, the first one again probably being controlled by the rate of heat transfer to the beans and the

second by internal diffusion. A relationship was derived from the result which could be used to determine the time of drying for a given set of conditions. This relationship was used to optimise the running conditions for minimum cost.