CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the study

Cocoa (Theobroma cacao) beans constitute a global raw material for the chocolate industry, beverages, cosmetics, pharmaceuticals, and toiletry products [V. L. Deus, M. B. de Cerqueira e Silva, L. F. Maciel et al 2018]. Over fifty million people depend on cocoa for their livelihood with a global production capacity of 68% for Africa, 17% for Asia, and 15% by the Americas [M. E. Tardzenyuy and et al., 2020]. In Africa, the largest cocoa-producing countries by volume are Ivory Coast (1900 million tonnes (MT)/ear), Ghana (850 MT), and Cameroon with 250 MT of global supply in the cocoa market [PHAMA 2018]. This contributes significantly to the gross national incomes of these countries. The physics and chemistry of cocoa beans are very complex and change throughout its life span depending on the processing method and geographical origin [L. F. Maciel et al 2018]. As such, cocoa beans of commercial grade should conform to specified criteria among which are its moisture content, acidity, slatiness, polyphenol content, mouldiness, and mycotoxin production [S. Aroyeun, G. Adegoke and et al., 2009].

Cocoa bean quality depends on each of its production processes, from farming practices, region of origin, and transportation to industrial facility where transformation occurs. Fermentation and drying constitute key farmer based unit operations with strong influences in the final quality of cocoa beans and subsequent products. Recent studies on the drying process and effects on quality point to three principal issues—method, temperature, and duration of drying [J. M. Castellanos and et al., 2018]. Variations of these drying parameters impinge significant effects on moisture content, bean colour, pH, fatty acids, polyphenols, methylxanthines, proteins, and aromatic compounds that constitute outstanding quality parameters [J. E. Kongor and et al., 2016]. Although fermentation and drying have complementary influences on bean quality, a poor drying process of well fermented cocoa beans can result in beans of very poor quality since heat treatments affect bean quality parameters differently[M. R. Bikomo and et al., 2016]. In an attempt to

optimize the drying process and obtain optimal cocoa bean quality with minimal cost, several modifications in drying parameters have been carried out.

This review focuses on the recent innovations in the cocoa drying process and effects on quality parameters. It starts with a brief description of the most popular drying methods used in the drying of cocoa beans, recent advancements in the drying technology, and effects on bean quality parameters and ends with a tabulated summary of the drying methods and quality parameters.

1.2 AIM & OBJECTIVES

The aim of this study is to investigate the effect of continuous drying on the physical properties of cocoa seeds**.** While:

Specific Objective

To investigate the effect of continuous drying on the moisture content of cocoa seeds

To evaluate the impact of continuous drying on the size and shape of cocoa seeds

To determine the effect of continuous drying on the color and texture of cocoa seeds

To compare the physical properties of cocoa seeds dried using different methods

1.3 PROBLEM OF STATEMENT

Cocoa seeds are a crucial component of the chocolate industry, and their quality is significantly affected by the drying process. Continuous drying is a common method used to reduce the moisture content of cocoa seeds, but its impact on the physical properties of the seeds is not well understood. There is a need to investigate the effect of continuous drying on the physical properties of cocoa seeds to optimize the drying process and preserve the quality of the seeds.

1.4 SCOPE OF THE STUDY

This study will focus on the effect of continuous drying on the physical properties of cocoa seeds. The study will investigate the impact of different drying conditions, including temperature, humidity, and airflow, on the physical properties of cocoa seeds. The study will also compare the effects of different drying methods, such as solar drying and mechanical drying, on the physical properties of cocoa seeds.

1.5 JUSTIFICATION

The study on the effect of continuous drying on the physical properties of cocoa seeds is crucial because it addresses a significant knowledge gap in cocoa processing. Understanding the impact of continuous drying on cocoa seeds' physical properties can improve cocoa quality, enhance shelf life, and increase the economic benefits for cocoa farmers and processors.