Chapter 1

Introduction

1.1 Background

Body malodor is any unpleasant or unusual smell that comes from the body when bacteria on the skin break down substances released by perspiration (Benony et al., 2016). Individual differences in body odor are partially attributed to genetics, although environmental factors can also cause odors to change over time (Havlíček et al., 2017). Social interactions can be adversely affected by body malodor, which is frequently interpreted as an indication of inadequate personal hygiene. It can cause self-consciousness and low self-esteem, which can affect a person's confidence. Body malodor can also be uncomfortable in meetings, social events, and workplaces, interfering with conversations and making the space unwelcoming (Ariestini et al., 2023).

The mouth, the anogenital area, the scalp, and the axillae are among the body parts that release human body odors. However, axillary malodor seems to be the most recognizable in healthy adults, due to a comparatively large concentration of both apocrine and eccrine glands in the axilla (Havlíček et al., 2017). The unpleasant smell arising from the skin is typically caused by secretions from apocrine glands (Ramdani et al., 2020). According to Lundstrom & Olsson (2010), apocrine glands secrete the majority of the chemical substances, including proteins, lipids, and amino acids which are needed by microorganisms to produce odors. Gram-positive *Staphylococcus aureus* (*S. aureus*) bacteria are among the microorganisms that may be isolated from healthy skin and are commonly found in the axillary (Handayani et al., 2022; Taylor & Unakal, 2023). *S.aureus* will transform isovaleric acid, one of the amino acids found abundantly in apocrine glands, into short-chain volatile fatty acids which contributes to the unpleasant smell (Siskawati et al., 2014).

Deodorants, one of the personal care topical products, are used to solve the axillary malodor problem (Sabrina et al., 2022). Deodorants work by preventing the microorganisms from growing and so reducing the amount of odor that is produced as it contains antibacterial ingredients (Nurhaini et al., 2022). Deodorants also might include natural essential oils or perfume scents to cover up the smell of sweat. However, to prevent any bias, deodorant formulations used in this study do not include any sort of fragrance, this is due to the ability of active ingredients in the deodorants that are expected to be able to prevent the formation of microorganisms rather than simply masking body odor. Additionally, the fact that fragrance might cause skin irritation and allergic reactions should also be taken into consideration especially for fragrance-sensitive individuals (Zirwas & Moennich, 2008).

Roll-on deodorant is the type of deodorant used in this study. Roll-on deodorant is a common leave-on liquid deodorant that comes in glass or plastic bottles with a rotating ball dispenser that acts as an applicator to apply the deodorant onto the skin and improve body odor (Steinemann, 2016). The growing demand for deodorants that are pleasing, safe, and effective to prevent axillary malodor emphasizes the need for thorough research that considers both antibacterial efficacy and consumer's satisfaction. In collaboration with PT Symrise Indonesia, a well-known international provider of flavorings and fragrances, greatly enhances the value of this research. A pragmatic strategy that incorporates industrial experience and scientific insights is made possible by Symrise's proficiency in formulating deodorant products. This collaboration aims to increase the overall efficacy of deodorant formulations while preserving their consumer appeal.

1.2 Objective

- To evaluate the antibacterial effectiveness of three different deodorant formulations from PT Symrise Indonesia against the *Staphylococcus aureus* using the chosen *in vitro* testing methods.

- To analyze consumer acceptance towards application, after-feel, and general acceptability of three different deodorant formulations from PT Symrise Indonesia through sensory evaluation.

1.3 Hypothesis

- The three deodorant formulations exhibit antibacterial activity as observed through the use of *in vitro* methods.
- There is significant difference in consumer acceptance between each sensory attribute of the three deodorant formulations.