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MICROBIOLOGICAL CONTAMINATION OF SELECTED HERBAL MEDICINAL PRODUCTS AT OKAISHIE DRUGSTORE LANE, GHANA

BY

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DECLARATION

I, Owusu Andrews Yeboah hereby declare that this dissertation is a result of my independent work. References to other works have been duly acknowledged. I further declare that this dissertation has not been submitted for award for any degree in this institution and other universities elsewhere.

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(ACADEMIC SUPERVISOR)

DEDICATION

I dedicate this work to the Almighty God for His love, grace and mercy towards me. Also, to my parents Mr. Robert Owusu-Yeboah and Mrs. Josephine Owusu Animah and my entire family.

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ABSTRACT

Herbal remedies derived from plants have been used for thousands of years in various cultures. The rising popularity of herbal remedies all over the world has highlighted the importance of ensuring their safety and efficacy. The aim of the study was to determine the microbial contamination of orally administered herbal products sold in Ghana's Okaishie Drug Store Lane. Standard microbiological methods were employed in the enumeration of coliforms and the identification of pathogenic microbes in 272 orally administered herbal products (Liquid, teas, powder and capsules). Results showed that 38 (14%) products evaluated were non-compliant with the international standard for microbial analysis. During the identification of the pathogenic bacteria, it was revealed that 94.5% complied with compendial requirements when it comes to Escherichia coli while 5.5% did not. For Salmonella spp. 2.6% did not comply. The Total Aerobic Microbial Count (TAMC) recorded for those that complied and those that did not comply with the compendial requirements are 67.6% and 32.4% respectively. Total Yeast and Mold Count (TYMC) recorded non-compliance of 14.3%. For capsules 87% complied with international standard while for the liquids 84.5% complied. The powders recorded 19.4% non-compliance and teas 4.9% non-compliance. Overall, for the dosage forms the not registered has higher levels of non-compliance with the highest 37.5% representing powders followed by liquid having 32.5% and then capsules 22.5%; teas have the least non-compliance of 12.5%. For the Registered, teas have the highest compliance of 96.7% and lowest 62.2% representing powders; 15.8% is the highest that Does not comply when it come to the Registered products found in the powders followed by liquid and capsules both having a percentage of 13.6% and the least is Teas having 3.3%. The presence of these bacteria and fungi in herbal medicines poses a major health concern to both patients and the general public. As such, there is a pressing need for the continuous

monitoring and regulation of the quality standards of herbal medicines that are made available in the aforementioned location.

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LIST OF ABBREVIATION

FDA	Food and Drugs Authority
GMPs	Good Manufacturing Practices
TAMC	Total Aerobic Microbial Count
TYMC	Total Yeast and Mold Count
CAM	Complementary Alternative Medicine
HMPs	Herbal Medicinal Products
MOH	Ministry of Health
GHS	Ghana health Service
CPMR	Center for Plant Medicine Research
B.P	British Pharmacopoeia

CHAPTER ONE

INTRODUCTION

1.1 Background

Herbal medicine, a subset of complementary and alternative medicine, is based on the therapeutic use of plants and plant extracts (Adhikari and Bhusan, 2018; Yuan et al., 2016). The symptoms of piles, diabetes, headaches, skin infections, toothaches, typhoid fever, and STIs can all be reduced with the use of these herbs. Herbal remedies are made from various parts of plants, including the seeds, roots, barks, leaves, and flowers (Abba et al., 2010). More than 80% of the global population uses herbal therapies, either exclusively or in conjunction with conventional treatment, and this number is growing rapidly (Alwakeel, 2008; Dei-Tutuwa et al., 2014; Nwoko and Mgbeahuruike, 2011). Traditional medicine is widely practiced and accepted as a crucial part of the healthcare infrastructure in many African countries. Many individuals prefer them over standard medical care for a variety of reasons, including their ease of access, low cost, widespread cultural acceptance, and favorable benefits on patients' spiritual, religious, and social lives (WHO,2019). Thus, in countries with a less developed healthcare infrastructure, the World Health Organization (WHO) has been pushing for the acceptance of herbal remedies as part of standard medical practice (Kulkami et al., 2010). However, potential roadblocks to this aim exist. They include poor quality, low efficacy, and poor safety profiles of herbal medicines. This is the situation in Ghana, Africa where 70% of patients really believe the traditional medicine can cure better, particularly for diseases such as sickle-cell, diabetes and hypertension, choose to treat themselves using herbal medicines (WHO, 2019). Despite the availability of numerous international standards (World

Health Organization, 2013) for use in Ghana, quality assurance and control of herbal medicines remain complex, subtle, and tough to apply (Dei-Tutuwa et al., 2014)

Herbal medicine buyers must be especially cautious about microbial contamination (Zhang et al., 2012). Similarly, to air and water, the soil in which plants are grown can serve as a home for microorganisms. If therefore, raw and processed medicinal plant materials are handled or stored poorly, they can introduce pathogens to the body (Shaban et al., 2016). Before, during, and after harvest, the possibility of microbial contamination of these goods may rise in conditions of high temperature, high humidity, and heavy rains (Kneifel et al., 2002). Due to their organic nature, herbal medications are more likely to become tainted by bacteria and other microbes. Shifts in the proportions of the herb's bioactive components could reduce its therapeutic value over time. Poor quality and possibly no therapeutic value are typical of products made in this manner (Gautama et al., 2009). Because of the need to ensure that herbal medical preparations for oral use are free of harmful microorganisms, the British Pharmacopoeia (B.P.) includes a separate monograph on the microbiological quality of such products (British Pharmacopoeia, 2019). This monograph can serve as a benchmark against which the history and therapeutic applications of individual herbs can be examined when assessing their efficacy and safety. Ingesting a contaminated herbal medication over a prolonged period of time can result in a potentially fatal infection.

Although in Ghana, herbal medicines may be susceptible to microbial contamination, however, little is known about the types and levels of microbial contamination in these products. Thus, this study sought to examine the microbial contaminations of herbal products sold at Okaishie Drug Store Lane, a well-known shopping area and significant provider of herbal medicines in Ghana. There are more than 500 stores in this area dedicated to selling medicinal herbs. The results of this research will undoubtedly be helpful in persuading companies, governments, and politicians to

improve the quality of herbal products on the market.

1.2 Problem statement

Herbal medicine is promoted as an integral aspect of contemporary healthcare systems through various media including radio, television, newspapers, and internet (Gollschewski, et al, 2003; Soner et al.,2013). It can be used in place of or in conjunction with traditional, orthodox, or western medical care (Gardiner et al.,2003). The decision to try a herbal remedy may be prompted by advice from a doctor, a friend, or the Internet, or it may be entirely self-driven (Vickers et al.,2006). Over 80% of the population, according to some estimates, makes use of herbal medicine (Ekor, 2013). There may be a difference in the percentage of the population that uses herbal medicine even though its benefits are shared by those living in both urban and rural settings (Ndhlala et al.,2013; Cano & Volpato, 2004). However, microbiological safety of herbal medications is a major worry in the developing world since there are concerns that they may be made in unsanitary conditions, putting consumers in danger (Rajkumar and Sriram, 2021; Abtahi and Nourani, 2017; Khattak, 2012). These dangers include those to the neurological system, the heart, and the blood (Palmer et al., 2003).

Herbal treatments from Ghana (Odonkor et al., 2011; Dei-Tutuwa et al., 2014) and other African nations (Adeleye et al., 2005; Adeola et al., 2012; Amosu et al., 2014; Enayatifard and Asgarirad, 2010; Okunlo et al., 2015) have been reported to contain hazardous microorganisms (Dlugaszewska et al., 2019; Fenclova et al., 2019; Koch et al., 2005). Herbal remedies, especially when used for extended periods, may harbor microorganisms that could cause illness or infection.

Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa, Staphylococcus aureus, Bacillus spp, Enterobacter spp, Klebsiella pneumoniae, and *Proteus mirabilis* are some of the

most prevalent microbial pathogens detected in herbal medicines. (de Sousa Lima et al., 2020; Yusef et al., 2020).

1.3 Justification

Herbal medicine is used by 70% of patients in Ghana, and is revered as the "Holy Grail" due to its lack of negative side effects. However, it is vital that the quality of these medicines be of the highest possible standard, both in terms of their efficacy and their safety, as the vast majority of customers use herbal medicines without the guidance of a trained professional (Tulunay et al., 2015).

Orthodox medicines and traditional pharmaceutical dosage forms are too expensive for the average Ghanaian, traditional medical services are difficult to access, especially in rural areas, and the general public is wary of the market due to allegations of inferior or counterfeit pharmaceuticals, all of which contribute to herbal medicine's popularity in the country. Herbal medicines also can be effective and, more significantly, safe for their users, although this depends largely on the product's quality (Jutaputti, 2001). It is crucial to address all related safety concerns as the market for herbal medicines expands in many African nations, in part due to the fact that they are being used to treat COVID-19 (Demeke, 2021).

There are a number of problems with herbal medicines that have been uncovered, including a lack of safe dosing instructions and a dirty manufacturing procedure. Poor processing, as well as the plants themselves, can introduce microorganisms into herbal treatments. This calls for a check of the herbal remedy for the presence of microorganisms. For this reason, the WHO developed a set of scientific criteria to evaluate the efficacy of herbal medicine (WHO, 1998; WHO, 2000).

However, the biopharmaceutical quality and behavior of herbal medicinal products are not always fully recognized (European Agency for the Evaluation of Medicinal Products, 2003). The Food and Drugs Authority Ghana manages commercially available medications in Ghana and is accountable for ensuring the quality of herbal medicinal products. The approach used to evaluate different herbal remedies in this study is based on the British Pharmacopoeia, the standard used by the FDA in Ghana.

1.4 Aim and objectives

1.4.1 Aim of the study

To determine the microbiological contamination of herbal products sold at Okaishie Drug Store Lane, Ghana.

1.4.2 Objectives of the study

- To compare the microbiological contamination of herbal medicinal products with the British Pharmacopoeia 2022

- To compare the microbial contamination between FDA registered and unregistered herbal products

1.5 Research questions

- What is the microbiological quality of some herbal medicinal products at Okaishie Drug Store Lane, compared to British Pharmacopoeia 2022?
- What is the microbial contamination comparison between FDA registered and unregistered products?

1.6 Conceptual framework

The core of the research, to determine the microbiological contamination of selected herbal medicinal products at Okaishie Drugstore Lane in Ghana, have two main components in determining it. They are "Data collection" and "Data Analysis", the Data Collection is where data is collected to access the microbial contamination. It involves subcomponents such as "Sampling" and "Laboratory Analysis." The other main component is Data Analysis, here after the Data Collection the research moves to data analysis where the data collected is processed and assessed for contamination. Subcomponents may include "Microbial Load Assessment" and "Pathogen Identification."

Factors that influence each of the main components are; for the Data Collection it includes "Storage Conditions," "Product Type," and "Production Practices." When it comes to Data Analysis component it includes "Statistical Methods" and "Health Risk Assessment."

Lastly, potential outcomes and applications of the research are identified, "Recommendation is a component here, where the research may lead to practical recommendations based on the findings. Subcomponents within this category could include suggestions for "Improved Storage Practices," "Regulatory Measures," and "Consumer Education." The component that closely follows the Recommendation is the "Conclusion" which serves as the endpoint of the research where the study's findings and implications are summarized (Figure 1).

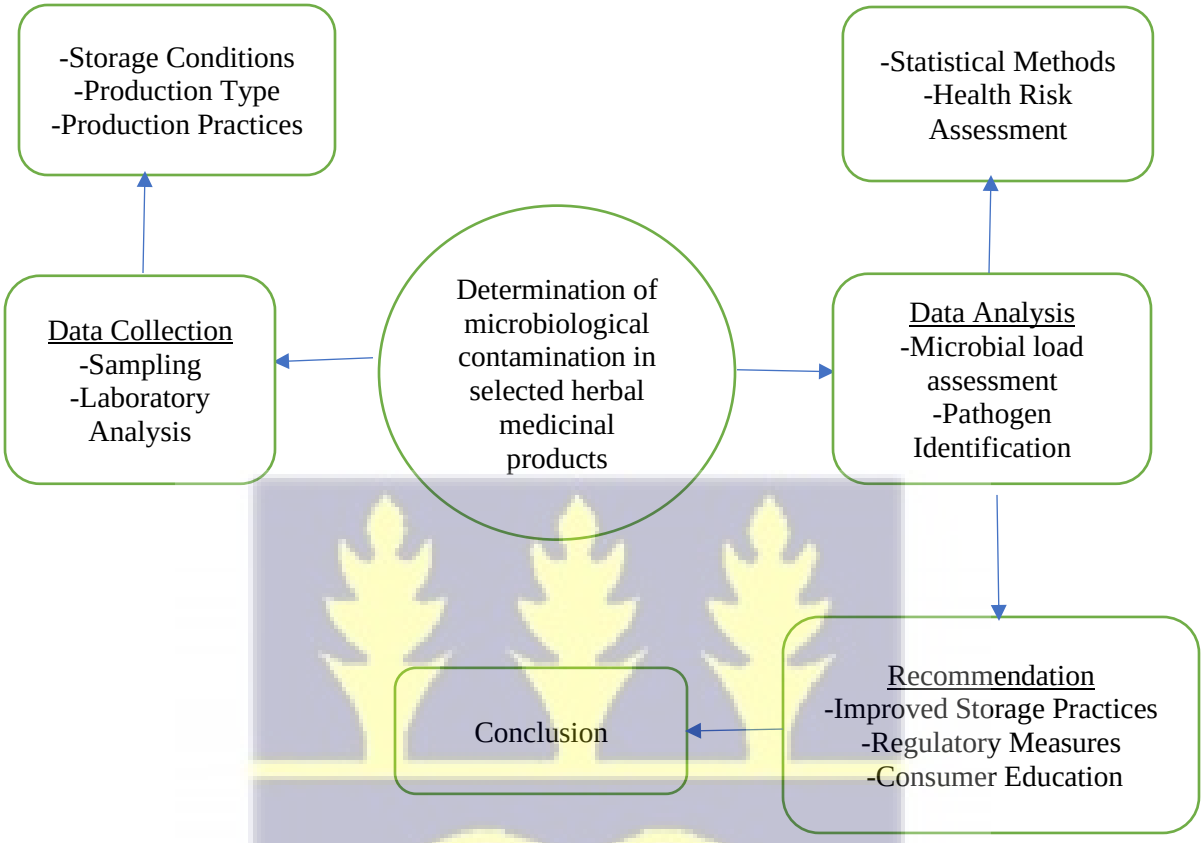

FIGURE 1.1: CONCEPTUAL FRAMEWORK

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Herbal medicines have been used to treat a wide variety of conditions since ancient times, far before the advent of western medicine. Herbal medicine has undergone a period of rapid development and improvement in the last several decades thanks to the widespread adoption of cutting-edge technology in cultivation, processing, and delivery (Mazina et al.,2015; Yang et al.,2015). As a result, herbal medicine can be taken in many different forms, such as tablets, capsules, ointment, powder, and tincture liquid (Zhang et al., 2015).

To assure the safety of herbal remedies, they are investigated in dedicated labs that extract and evaluate the numerous active constituents (Centre for Plant Medicine Research, 2013). For the safety of those taking herbal supplements, it is the responsibility of the food and drug administration (Awodele et al.,2012). It is illegal to sell herbal medicines without first obtaining the appropriate licences and undergoing a rigorous inspection of the manufacturing process (Merrills et al.,2013; Zhang et al., 2015). The Food and Drug Authority issues licenses to herbal medicine manufacturers in Ghana (FDA). The drug's efficacy and safety must first be confirmed by the Centre for Research into Plant Medicine before these licenses are issued. The effectiveness and safety of herbal treatments depends greatly on their quality, as acknowledged by the FDA. For pharmaceuticals and herbal medicines to be of the highest quality, it is essential to implement quality control procedures throughout the manufacturing process. Implementing this strategy effectively requires the use of GMPs (Good Manufacturing Practices).

Herbal medicines are formulated using a wide variety of plant components sourced from various geographic regions and commercial sources. However, conventional medications are typically fabricated from synthetic materials using standardized, repeatable manufacturing methods and procedures. Because of this, knowing for sure how they were stored is unlikely in most situations. Furthermore, their physical composition and appearance may also vary. In addition, the processes and procedures used to produce and ensure the quality of herbal medications are often very different from those employed in the creation of conventional pharmaceutical products. Because of the inherent complexity of organically grown medicinal plants, the amount of active components in a given batch, and the strict limits placed on their quantity, the production and basic processing of herbal medicines have a direct impact on their efficacy. Good manufacturing practices are thus an important part of ensuring the highest quality while creating new herbal medications (GMPs).

Herbal products raise serious concerns about the possibility of microbial contamination (Zhang et al., 2012). In any environment where plants are grown, microorganisms are possible in the soil, air, and water (Shaban et al., 2016). Raw and processed components of medicinal plants are susceptible to microbial contamination if not handled and stored properly (Shaban et al., 2016). Before and after harvest, these goods are vulnerable to microbial contamination from the environment if temperatures, humidity, and precipitation are high (Kneifel et al., 2002). Due to their organic nature, herbal medicine preparations are more prone to microbial contamination, which can result in the gradual deterioration of the bioactive substances and even alterations to the medication's composition. The final products aren't as high-quality or useful for their medicinal purpose as they could be (Gautama et al., 2009). Because of the potential for contamination, herbal medicines for human use have their own microbiological purity monograph in the British

Pharmacopoeia (B.P.) (British Pharmacopoeia, 2022). This monograph provides a standard against which the efficacy and safety of diverse herbal medicines can be evaluated, taking into account the individual characteristics of each plant and the context in which it will be used. Because of the risk of exposure to pathogenic bacteria, taking contaminated herbal remedies poses a significant threat to the health of anyone who takes them for an extended period of time.

2.2 Prevalence of herbal medicine usage among Ghanaians.

According to a survey conducted by the World Health Organization (WHO), between 70% and 80% of the global population relies on CAM, the vast majority of which is derived from herbal sources, as their primary healthcare (Abba et al., 2010). Many African communities rely heavily on traditional medicine as part of their healthcare infrastructure. Some people prefer them over standard medical care because they are more suitable to their lifestyles, more cost-effective, more widely accepted culturally, or because of the spiritual, religious, or social values associated with them. Traditional medicine advocates make up a much higher fraction of the population than those who favor conventional medical practices (WHO, 2019). According to Kretchy et al. 2021, herbal medicine is widely used in Ghana. Seventy-three percent of those polled said they had used a herbal remedy in the previous year, with that number rising to 76.5% among regular users. Of those surveyed, slightly under 60% claimed they depended on HMPs that had gained formal approval from the Ghana Food and Drugs Authority. About 56.7 percent of consumers used these items as a first line of defense against illness. Every socioeconomic factor (age, religion, marital status, education level, and employment position) except for sex were significantly associated with the use of HMPs ($P < 0.001$).

2.3 Types of herbal medicines in Ghana

Plant and tree parts, including leaves, roots, fruits, and stem bark, are all employed in the creation of herbal medicines (Ndhlala et al.,2011; van Andel et al2015). (Ndhlala et al.,2011; van Andel et al.,2015). Appiah et al. (2018) report that just 17% of herbal medications are derived from stem bark, whereas 52% are obtained from plant leaves. A part of root and root barks (12%). Seeds, fruits, the entire plant, flowers, rhizome, cob, and cloves are far less frequently mentioned. Herbs used for medicinal purposes are typically harvested in the early morning hours from lowland areas with loamy soil, which can be found in either natural or degraded settings.

About two-thirds of herbal medicines are produced as decoctions, with the remaining third as infusions. Most cases involving herbal remedies had oral administration (77%), with nasal administration (1%), and rectal administration (2%) being the least common methods of administration. (Boadu & Asase, 2017). The leaves of plants are where photosynthesis occurs, and because of this they are often used in complementary and alternative medicine. Considering that leaves are the plant kingdom's primary structural component, this makes sense. When compared to harvesting a plant's roots or bark, using a lot of leaves has significantly less of an effect on the plant community's population. It's one benefit of relying mostly on the plant's leaves (Busia et al., 2016)

2.4 Reasons of Herbal medicines usage among Ghanaians

Natural or manufactured uses for plant components may involve crushing, drying, and boiling which makes herbal medicines easy to prepare and use (van Andel,2012). Some of the conditions that may entice individuals to respond to this method of treatment include infertility,

dysmenorrhea, fibroid tumors, and migraine headaches according to multiple studies (Okanlawon et al., 2011; Cheng et al., 2008; Yen et al., 2015; Gardner et al., 2016; Cano and Volpato (2004).

Herbal medicine's efficacy in treating specific diseases has been met with mixed results (Liu et al.,2015) A number of factors, including the naturalness of herbal medicine (Tribess et al., 2015), the lack of or mild side effects (Leach and Page et al., 2015), hospital waiting times (Awodele et al., 2012), the ineffectiveness of western medicine, patient autonomy in treatment decision-making, convenience of availability, and skepticism of conventional medicine, contribute to herbal medicine's popularity (Gollschewski,2008; Vickers et al.,2006). Some people, however, opt not to use herbal medicines for various reasons. A lack of reliable scientific proof for the safety of herbal remedies, combined with negative past experiences with doctors, pharmacies, health food stores, and other similar establishments, has made many individuals reluctant to use them (Ndhlala et al.,2011; Vickers et al.,2006). Some people seek out herbal treatments when they find no relief from their symptoms with conventional methods, or when they have reason to assume that their health condition cannot be effectively treated with allopathic pharmaceuticals (Mhame et al.,2010). Herbal medicines have been proven effective for treating a wide range of medical diseases, including those that were previously assumed to have a spiritual cause or to require holistic methods (Abdullahi et al., 2011).

2.5 Pharmacopoeia and Herbal Monograph standard in Ghana

A pharmacopoeia is a reference book for the preparation of quality medicines, published by the authority of a government or a concerned society, that compiles recognised pharmaceutical requirements regarding the quality, testing, storage, dispensing, and designation of medicinal products and the substances used in their manufacture. Also included are specifications for packing

materials and containers. There are numerous pharmacopoeias around the world, including the British, Indian, Japanese, and US pharmacopoeias. (Alamgir,2017)

By establishing reliable, industry-wide quality benchmarks for pharmaceuticals and their constituents, pharmacopoeias contribute to better public health. It is crucial that these criteria be suitable, as they ensure that medicines entering the market are safe for use by patients. As such, it is an integral part of the system for ensuring the safety of pharmaceutical products for use by the general public. The establishment of these organisations allows for the unhindered distribution of pharmaceuticals in Ghana and elsewhere.

The United Kingdom uses the British Pharmacopoeia (BP) as its official pharmacopoeia. This compilation of quality criteria for pharmaceuticals is released annually. The popularity of the British Pharmacopoeia has led to its adoption in more than a hundred nations. The BP has been adopted as the national standard in a number of nations, including Ghana, Australia, and Canada. (British Pharmacopoeia, 2022).

BP has a monograph for herbal medicine that reviews traditional and scientific data on the efficacy and safety of various botanicals in order to encourage the responsible use of herbal medicines with the highest possible degree of efficacy and safety (Alamgir,2017). Because of this, the Food and Drugs Authority in Ghana uses the BP guidelines to control the distribution of herbal remedies nationwide.

2.6 Possible Negative Effects and Dangers Associated with Certain Herbal Medications

Herbal remedies have a false reputation for being risk-free. There is still a sizable user base that relies on them, and some patients even take them with conventional medicine. This is very common in the management of chronic conditions including diabetes, high blood pressure, thyroid

disease, etc. Many for-profit sites assert that herbal medicines are risk-free and effect-free, but this is not the case (Fatima and Nayeem,2016). It has however been established that several different herbs can cause serious health problems, and in some cases even death. The potential for a medicine to have negative effects on living creatures is what is meant by the phrase "toxicity."

Toxicology is the field that investigates how chemicals can harm living things and how this might be treated medically. Toxicology studies investigate the short-term, intermediate-term, and long-term impacts of substances. Both the intensity and length of treatment have a major role in determining the category into which one falls. Acute toxicity studies the consequences of a single, large dose of a toxin during a period of no more than 24 hours. Professionals known as toxicologists conduct studies of this nature. If this happens, the organism's biological systems could be severely compromised, if not destroyed. Chronic exposure, such as when a toxin is injected over a long period of time (months or years), can cause permanent poisoning. For Denny and Stewart (2013) Subacute or subchronic toxicity is a form of poisoning that falls between the "acute" and "chronic" stages. The skin, eyes, liver, kidneys, and intestines are all vulnerable to harm from herbal remedies (Liu et al.,2015; Hsieh et al.,2012). The widespread idea that herbal medication is safe since it has no known side effects is thus refuted. There is a wide range in both the types and numbers of bioactive chemicals produced by microbes that can be isolated from different plant species for medical application. Because of the chemicals they contain, some of the plants used in traditional medicine could be harmful. Some plants are considered harmful to humans in traditional medicine. Among these are the Atropa belladonna, many types of Datura, and various forms of the Digitalis plant (Nasri & Shirzad, 2013). For those working with herbs after harvest, preventing deterioration from filamentous fungi is a top priority. In addition to coloring, quality deterioration, reduced commercial values, and reduced therapeutic potential,

fungal infection of stored herbal remedies can cause many diseases of the liver, kidney, neurological system, muscular, skin, respiratory organs, digestive organs, and sexual organs etc. (Rai and Mehrotra 2005; Trucksessand and Scott, 2008).

2.7 Microbial Contamination of herbal medicine

Traditional herbal therapy in Ghana is plagued by microbiological and mycological contamination issues (Turkson et al., 2020). If plant materials aren't handled appropriately during harvesting, storage, or processing, issues like these could result. Materials from recently harvested plants need to be washed in running water, allowed to dry in the air, and then stored in a cool, dry, and airtight place. If this doesn't happen, dangerous bacteria and germs including enterobacter, enterococcus, shigella, and streptococcus may start to spread (Esimone et al., 2007). Mycotoxins including aflatoxins, fusarial toxin, ochratoxin, citreoviridin, and penicillic acid can contaminate plant material if the conditions are right. These highly toxic compounds leave the material completely unusable. It has proven difficult to handle microbial and mycotoxin contaminations in tropical and subtropical parts of Ghana. These microorganisms and the toxins they produce thrive in warm, moist environments. There's also the possibility that people introduced disease to the herbs (WHO,2007). Throughout the harvesting/collection phase, the post-harvest processing phase, and the pharmaceutical production process, it is expected that microbial contamination will emerge due to the product being handled by workers who are contaminated with harmful germs. Good Manufacturing Practice (GMP) and related concepts for best practice should be applied to keep this under control (WHO,2007). Bacterial testing confirmed the presence of E. coli, Salmonella spp., and P. aeruginosa, all of which are markers of fecal contamination, showing that these herbal treatments had been tainted with human excrement. This points to unsanitary practices during

preparation and storage of the herbal remedies. The presence of bile-tolerant gram-negative bacteria of the family Enterobacteriaceae is a key indicator of sanitation risks, subpar processing, or post-processing contamination. Food poisoning may be caused by microorganisms of this family, increasing the risk of gastrointestinal illnesses in those who ingest contaminated food. The presence of E. coli is symptomatic of fecal contamination hence it is reasonable to presume that any herbal remedies containing this bacterium were tainted with human or animal excrement and should not have been consumed internally (Esimone et al., 2007).

2.8 Influence of Regulatory Policies on Safety of Herbal Medicines

At a meeting in 2005, the Government of Ghana developed the Traditional Medicine Policy in conjunction with the Ministry of Health (MOH), the Ghana Health Service (GHS), the Food and Drugs Authority (FDA), the Ghana National Drugs Programme, the Centre for Plant Medicine Research (CPMR), the Centre for Scientific and Industrial Research (CSIR), and the Ghana Federation of Traditional Medicine Practitioners Associations (GHAFTRAM). The government needs a basis for setting both short-term and long-term goals for the advancement of traditional medicine, and this policy statement is meant to serve as that basis. The government has promised that if it keeps funding research into alternative medicine, it will improve the quality of health care across the country. Traditional medicine, intellectual property rights, the use of traditional medicine, and the application of suitable regulations are all discussed as policy topics. Educating the next wave of CAM professionals; Responsible use of resources and protection of biodiversity; Global networks for sharing information and expertise; Spreading new, useful information and commercially viable innovations technology and scientific research Documentation, information sharing, and baseline data collection; Standardization, quality assurance, and large-scale

production; Public information and education on the sensible application of alternative medicine; (MOH, 2005).

The Traditional Medicine Policy is essential to the TAMD's overarching mission of coordinating the early stages of policy creation and their subsequent implementation. There are three distinct divisions within the Directorate, each of which plays an important part in enforcing national policies that encourage the development and continued use of traditional medicines. Examining existing TAMD policies and developing new ones is the responsibility of the Traditional and Alternative Medicine Policy and Regulation Unit. The expansion and refinement of licensing and regulatory systems, methods, plans, strategies, processes, and standards is how the Traditional and Alternative Medicine industry keeps its operations above board. The Research Unit's tasks include data collection, in-depth analysis, and policy evaluation for use in the TCM business as well as monitoring and assessing the state of the market. Finally, it is the responsibility of the Information and Communication Unit to enlighten Ghanaians about complementary and alternative medicine (CAM), develop and evaluate CAM-related communication strategies, provide forums in which policy is debated, and advocate for CAM-friendly reforms. The Traditional Medicine Practices Advisory Council is charged with overseeing all forms of traditional medicine in the United States (TMPC). There are regional offices spread across the country to facilitate the registration and issuance of licenses to practitioners, the inspection and granting of permits to premises of operation (herbal clinics and shops), and the organization of qualifying examinations for students working towards becoming professionals. The FDA regulates herbal supplements since they are considered a form of alternative medicine. Before being sold in Ghana, all herbal products must be approved by the country's Food and Drug Administration (FDA). Herbal medications submitted for registration are reviewed, analyzed, and quality and

safety testing is conducted by the FDA's Pharmaceutical Microbiology unit before licenses are issued for public sale. Each product of this sort that is approved by the FDA is given a unique registration number to aid in the tracking of items that have not yet been registered.

2.9 Challenges of contemporary herbal medicine practice in Ghana

It has been established that plant medicine plays an important role in Ghana's health care delivery system, and while the majority of the population is aware of the concept of plant medicine and its use of medicinal plants in the treatment of various diseases, there is still a subset of the population that views the practice as superstitious and has not yet accepted it. Despite plant medicine's widespread use and recognition in Ghana, the vast majority of allopathic doctors still frown down on its use and would never prescribe it to their patients (Busia ,2005). Even though there is a lack of data to back the statement, some people are quick to blame the utilization of plant drugs, such as those used for kidney and liver disorders. It's important to note that traditional herbalists get furious and frustrated when they hear such claims, but they have no way to disprove them because allopathic methods are inherently vague. Herbal medicine and the utilization of medicinal herbs in Ghana have been impeded by antagonism between two groups (Busia ,2005)

Investment in fixed assets is essential in the herbal medicine company as it is in most others if mass production of superior products is to be achieved. Most herbalists, however, are members of marginalized communities who lack the economic means to conduct the extensive research and mass-produce the quantities of product required for commercial success. These high-quality herbal treatments are often solely used by herbalists in their own communities; they are never distributed to other regions of the country. With a modest investment, Ghana might conduct studies, mass-produce herbal treatments in sterile packaging, and register the commodities, boosting their profile

domestically and paving the way for international sales.

CHAPTER THREE

METHODS

3.1 Type of study

The study, which is a cross sectional one, was designed to detect the presence of microbes in herbal medicines. Herbal Medicines were randomly sampled from traditional medicine distributors and retail pharmacy outlets in Okaishie Drug Store Lane.

3.3 Description of Study Site

Okaishie Drug Store Lane is a well-known Stores Lane in Makola-Accra. However, the region is well-known for its pharmacy store lane, which acts as a key distribution hub for almost 98% of the herbal medicines marketed throughout Ghana.

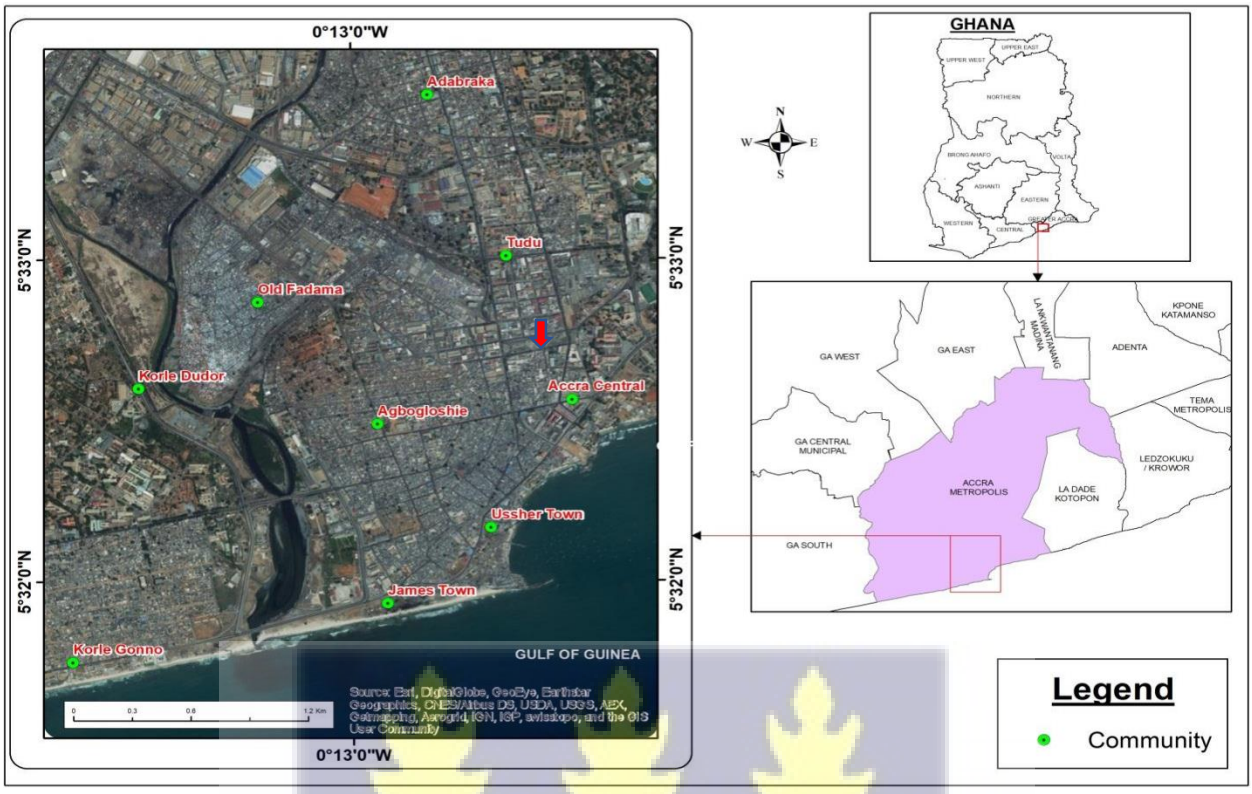

FIGURE 1.2: MAP OF THE ASHIEDU KETEKE SUB-METROPOLITAN DISTRICT

3.4 Sample size determination

Cochran's (1977) formula was used to estimate a desirable sample size herbal medicine. The sample size was calculated as follows:$n = \frac{z^2 \times p(1-p)}{d^2}$, where n is the sample size, z is the standard normal distribution taken as 1.96, p is the estimated prevalence rate of herbal microbial contamination in Ghana being 77% (0.77) (Darkwa et al., 2022) and d is the margin of error equal to 0.05. $n = \frac{1.96^2 \times 0.77(1-0.77)}{0.05^2}$; therefore, the minimum sample size for this study was 272.1 = 272.

3.5 Sample collection, Study population and sample transportation

A total of Two Hundred and seventy-two (272) herbal medicinal products that were made for oral administration were sampled from traditional medicine distributors and retail pharmacy outlets in Okaishie Drug Store Lane. The sample were transported on ice to the Food and Drugs Authority's Microbiology laboratory (British Pharmacopoeia Commission, 2022). All the purchased herbal preparations were transported on ice into the Food and Drugs Authority's Microbiology laboratory and were kept in a clean, cool and dry cabinet away from direct sunlight, prior to testing.

3.6 Inclusion criteria

Traditional herbal samples were in solution, powder, tea and capsules forms and were intended to be administered orally. Products sampled included those that have been registered with the Ghana Food and Drugs Authority as well as those not registered.

3.7 Exclusion criteria

Traditional herbal samples that are not orally administered.

3.8 Sampling method

For the collecting of herbal product samples, which took place from June to September 2022, a purposive sampling technique was used. One unit was purchased for multi-dose formulations (such as liquids, power, and tea), while at least three (3) containers or packs were purchased for single-dose dosage forms (such as capsules). Herbal medicinal products were acquired anonymously from pharmacies, and supermarkets along Okaishie Drug Store Lane in Accra. Because of ethical considerations, each sample was individually and serially coded before being analysed.

Among the 25 plazas (storey building containing pharmacies and supermarkets) located at Okaishie Drugstores, 15 plazas (APPENDIX IV) were selected for sampling because they had locally prepared orally administered herbal medicines and they contained all the various dosage forms-liquid, capsules, powder and tea unlike the rest that contained medicines that are not orally administered and orthodox medicines.

Also, with the dosage form, although most pharmacies and supermarkets lacked proper inventory record, liquid and capsules formulations were dominant compared with the powder and tea. This informed the sampling of more liquid and capsules formulations than the powder and teas.

3.9 Chemicals, reagents and equipment

All Oxoid Ltd. (Thermo Fisher Scientific Group) chemicals and reagents were of analytical quality. At various phases of investigation, Buffered Saline Peptone Water (BSPW), Tryptic Soy Agar (TSA), Sabouraud's Dextrose Agar (SDA), MacConkey Broth and Agar, Rappaport Vassiliadis Medium (RVM), Xylose Lysine Deoxycholate (XLD) Agar, urea agar slant, triple sugar iron (TSI) agar, Eosin methylene blue agar (EMBA) and 1% crystal violet. All media were made in line with the manufacturer's guidelines. All dilutions, plating, and preparations of samples for microbiological investigation were performed in a Class II biosafety cabinet (Telstar Biological Safety Cabinet Class II) to guarantee sterile conditions.

3.10 Microbiological analysis

Analyses were conducted at the Food and Drugs Authority Microbiology Laboratory-ISO 17025

(2017) Accredited Laboratory Shiashie-Accra Ghana in June to September 2022. The microbiological quality of herbal medicinal preparations intended for oral use was evaluated using methods described in the B.P. monograph (British Pharmacopoeia Commission, 2022). All tests were performed in duplicate. The total viable bacterial and fungal colony counts, as well as the presence of certain pathogenic bile-tolerant coliforms, were used to analyse the samples.

3.11 Sample preparation and incubation

In order to make the stock solutions, the herbal product was triturated in peptone water with a buffer added. For liquid products, a 10-milliliter sample was diluted with 90 milliliters of diluent to yield a 100-millilitre solution. A 10 g aliquot was triturated in 90 mL of the diluent to provide a homogenous suspension for capsule, tea, and powder formulations. The sample stock mixtures were serially diluted to 10^{-3} for liquid and capsules for bacteria and fungi and 10^{-4} for powders and teas for bacteria and fungi as prescribed in the British Pharmacopoeia Commission (2022). 0.1ml of the various dilutions was inoculated TSA (Tryptic Soy Agar) and SDA (Sabouraud's Dextrose Agar) plates in duplicates. Inoculum was spread evenly over surface of the media with a spreader. Inoculated plates were then incubated at the following temperatures; TSA- 32.5˚C for 72 Hours SDA- 22.5˚C for 7 days or bacterial and fungal growth, respectively.

3.12 Determination of total viable counts

After incubation, the total viable counts (TVC) of bacteria and fungi in the samples were independently assessed using a BZG manual colony counter. The total viable counts was determined by using two assumptions. First, the microbial contaminants were well mixed. Then, each cell was plated to grow into a colonial mass of cells, which could be counted individually

with a colony counter. Second, colonies growing on TSA were believed to be bacterial, whilst those growing on SDA were assumed to be fungal. From the least dilute sample solution to the most dilute solution, colonies were counted.

3.13 Sub-culturing, characterization and identification of bacterial colonies

The presence of bile-tolerant coliforms, including E. coli, Salmonella spp., and other Enterobacteriaceae, was indicated by turbidity and a light purple colour in the MacConkey broth subsequent to enumeration. Selective cultivation and purification of coliforms was carried out using MacConkey agar. The presence of pink or red colonies is indicative of lactose fermenters, whereas the presence of clear or translucent colonies, with or without black centres, is indicative of non-lactose fermenters. The Salmonella spp. cultures were initially cultivated in the RVM, which is a medium that selectively enriches the microorganisms. The cultures were subsequently transferred to XLD agar, which is a medium that is both selective and differential. Salmonella species are capable of generating hydrogen sulphide on Xylose Lysine Deoxycholate (XLD) agar, which leads to the formation of black colonies that are centrally located. In the course of incremental sub-culturing techniques, purified colonies were subjected to macroscopic examination for colony characteristics and microscopic evaluation for Gram-staining response and cell morphology. Pure bacterial colonies were subjected to biochemical tests to determine their ability to generate urease on urea agar slant and ferment sugar on TSI agar. The identification of coliforms that produce urease and those that do not can be achieved through the utilisation of a urea agar slant. The hydrolysis of urea by urease results in the production of ammonia, which can be detected in a medium containing the phenol red indicator through a discernible change in colour from orange to pink. Enterobacteriaceae that are urease-positive comprise of microorganisms such

as *Proteus mirabilis*, *Enterobacter cloacae*, and *Klebsiella pneumoniae*. In contrast, Escherichia coli and Salmonella species are known to produce urease. The employment of TSI agar for the differentiation of Escherichia coli and Salmonella spp. has been investigated. The TSI is a multi-test system that utilises differential methodology and comprises of glucose, lactose, and sucrose in addition to ferrous sulphate, with a ratio of 10:10. Fankhauser (2001) proposed that the classification of coliforms is based on their capacity to metabolise three types of sugars and generate hydrogen sulphide. Microorganisms capable of sucrose and/or lactose fermentation produce significant amounts of acidic byproducts, which cause the media to turn yellow in both the slant and butt regions while producing carbon dioxide. Lactose and sucrose are fermented by Escherichia coli. Microorganisms that solely ferment glucose, on the other hand, produce low acidity that quickly returns to alkaline conditions in the slant, causing the butt to remain yellow while the slant turns red. Salmonella spp. can only ferment glucose and produce hydrogen sulfide. This converts ferrous sulphate to ferrous sulphide, which appears in the culture media as a black precipitate (Fankhauser, 2001).

3.14 Data analysis and interpretation

Data was entered into Microsoft Excel 2019, cleaned, coded and merged before importing it to STATA /BE version 17.0 for analysis. Descriptive statistics was performed and data was summarized by compliance of different types of formulation, pathogen type, and registration status of products; using frequencies and presented in tables and charts.

The sampled herbal products' compliance with compendial standards was evaluated using two separate acceptance criteria (Appendix B) from the British Pharmacopoeia Commission's monograph for non-sterile herbal preparations for oral consumption (British Pharmacopoeia

Commission, 2022). Here are the two requirements: (a) the presence of pathogenic Enterobacteriaceae, including bile-tolerant Gram-negative bacteria, *Escherichia coli*, and/or Salmonella spp.; and (b) the mean bacterial and fungus count in an enumeration test. If a product satisfies either condition, it is considered compliant; otherwise, it is considered non-compliant. The total viable counts for enumerating bacteria or fungi are the mean of the duplicate count times the dilution factor. For bacteria and fungus, the limits for capsules, teas, and powders are five colonies at and dilution, respectively. For liquids, the limits for bacteria and fungus are five colonies at and dilution, respectively (British Pharmacopoeia Commission, 2022).

3.14.1. Total Viable Count Test Interpretation

For the total viable count, when it comes to the mean bacterial count, thus, the total aerobic microbial count (TAMC) is accepted to comply if the liquid formulation is not more than five colonies at 10^5 dilutions and with the tea, capsule, and powder formulations, it is accepted when not more than five colonies at 10^7 dilutions. When it comes to the mean fungal count, thus, total yeast and mold count (TYMC); for liquid formulation, its accepted to comply if its not more than five colonies at 10^3 dilutions and for the tea, capsule and powder formulation, not more than five colonies at 10^5 dilution is accepted to comply (APPENDIX II).

3.14.2. Gram-negative coliform Test Interpretation

For the Gram-negative coliform, Escherichia coli is interpreted to comply if for the liquid formulation there is complete absence per milliliter of sample of herbal sample; and also for the

tea, capsule and powder formulation, there is complete absence per gram of herbal sample. The Salmonella is interpreted as complying if the liquid formulation is showing complete absence per 25 milliliter of herbal sample; and also for the tea, capsules and powder formulation, complete absence per 25 grams in herbal sample indicates compliance (APPENDIX II).

CHAPTER FOUR

RESULTS

4.1 Characterization of the sampled products

Table 4.1 displays the two hundred and seventy-two (272) herbal medicinal products that were collected; this is exactly the amount of products that were expected to be collected (272) based on the Cochran Formula. The 272 products comprised 100 (36.8%) capsules, 100 (36.8%) liquid, 36 (13.2%) powder and 36 (13.2%) teas. Majority of the products representing 240 (88.2%) were registered or certified by FDA, Ghana and 32 (11.8%) were not.

Table 4.1: Characterization of the sampled herbal products

Variable	Frequency	Percentage (%)
Dosage Form	**272**	**100**
Capsules	100	36.8
Liquid	100	36.8
Powder	36	13.2
Teas	36	13.2
Registration status	**272**	**100**
Not registered	32	11.8
Registered	240	88.2

4.2 Overall conformity with pharmacopoeia microbiological quality specifications

Figure 4.1 shows the compliance of analyzed herbal products with pharmacopeial specifications. Out of the 100 capsules 87% complied and 13% does not comply, with the liquid dosage out of the 100, 84.5% comply and 15.5% does not comply. With the 36 powders 80.6% complied and

19.4% does not comply and out of the 36 teas 95.1% complied and 4.9% does not comply according to the British Pharmacopoeia, 2022 (APPENDIX III).

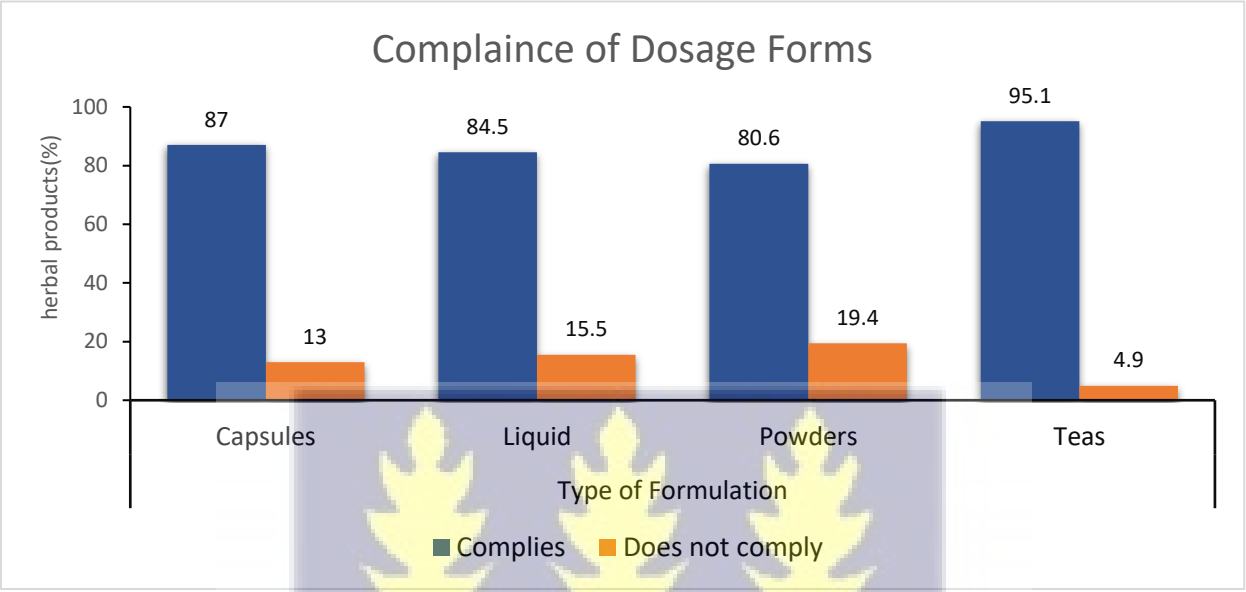

FIGURE 4.1 COMPLIANCE OF THE DIFFERENT TYPES OF FORMULATIONS WITH THE BRITISH PHARMACOPOEIA, 2022) (APPENDIX II) SPECIFICATIONS

4.3 Total viable count and identification of pathogenic bacterial isolates

Figure 4.2 represent the various test conducted on the selected herbal medicinal products, out of the 272 samples analyzed, the Total Aerobic Microbial Count (TAMC) recorded for those that complied and those that did not comply with the compendial requirements is 67.6% and 32.4% respectively. Total Yeast and Mold Count (TYMC) recorded for those that complied and those that did not is 85.7% and 14.3% respectively. During the identification of the pathogenic bacteria, it was revealed that of the 272 samples, 94.5% complied with compendial requirements when it comes to *Escherichia coli* and 5.5% did not comply. For Salmonella spp. 97.4% complied and

2.6% did not according to the British Pharmacopoeia, 2022 (APPENDIX II).

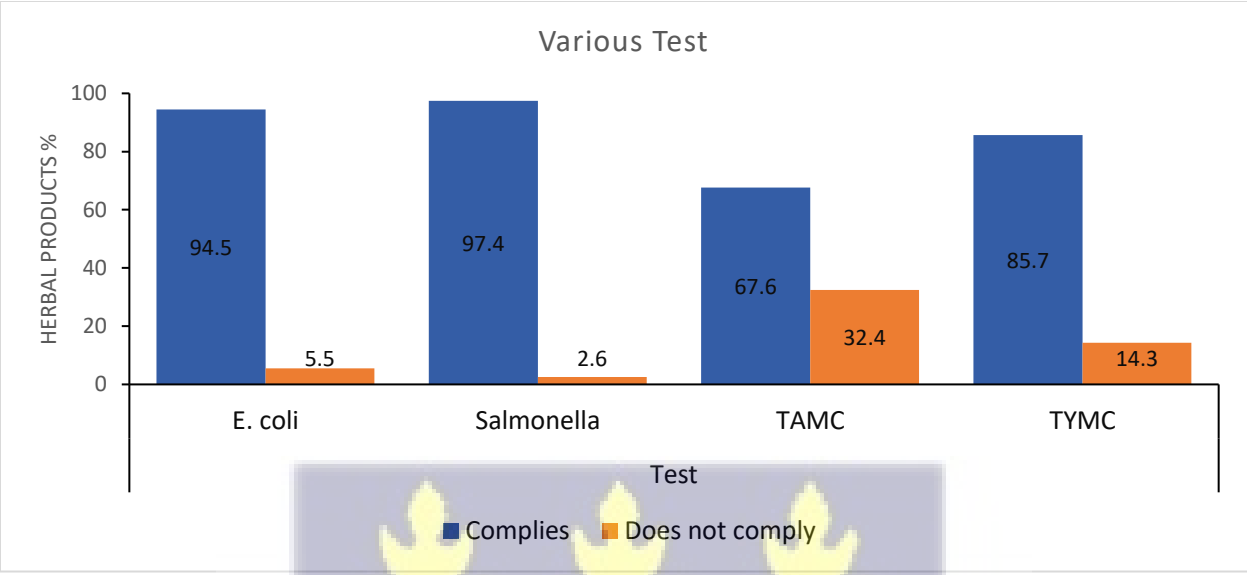

FIGURE 4.2 COMPLIANCE OF THE VARIOUS TEST CONDUCTED FOR HERBAL PRODUCTS WITH THE BRITISH PHARMACOPOEIA, 2022) (APPENDIX II) SPECIFICATIONS

N.B (ABBREVIATIONS) **TAMC** Total Aerobic Microbial Count

TYMC Total Yeast and Mold Count

E. coli *Escherichia coli*

4.4 Overall compliance with the British Pharmacopoeia, 2022) (APPENDIX II) specifications for microbiological quality

According to Figure 4.3, only 14% of the 272 herbal medicinal products did not meet with the pharmacopeial standards for microbiological examination because they failed the test for enumeration and/or test for specific harmful microorganisms. When stratified by the dosage form with registration status as depicted in Figure 4.4, overall, for the dosage forms the not registered has higher levels of non-compliance with the highest 37.5% representing powders followed by liquid having 32.5% and then capsules 22.5%; teas have the least non-compliance of 12.5%. For

the Registered, teas have the highest compliance of 96.7% and lowest 62.2% representing powders; 15.8% is the highest that Does not comply when it come to the Registered products also representing the powder formulation followed by liquid and capsules both having a percentage of 13.6% and the least is Teas having 3.3%.

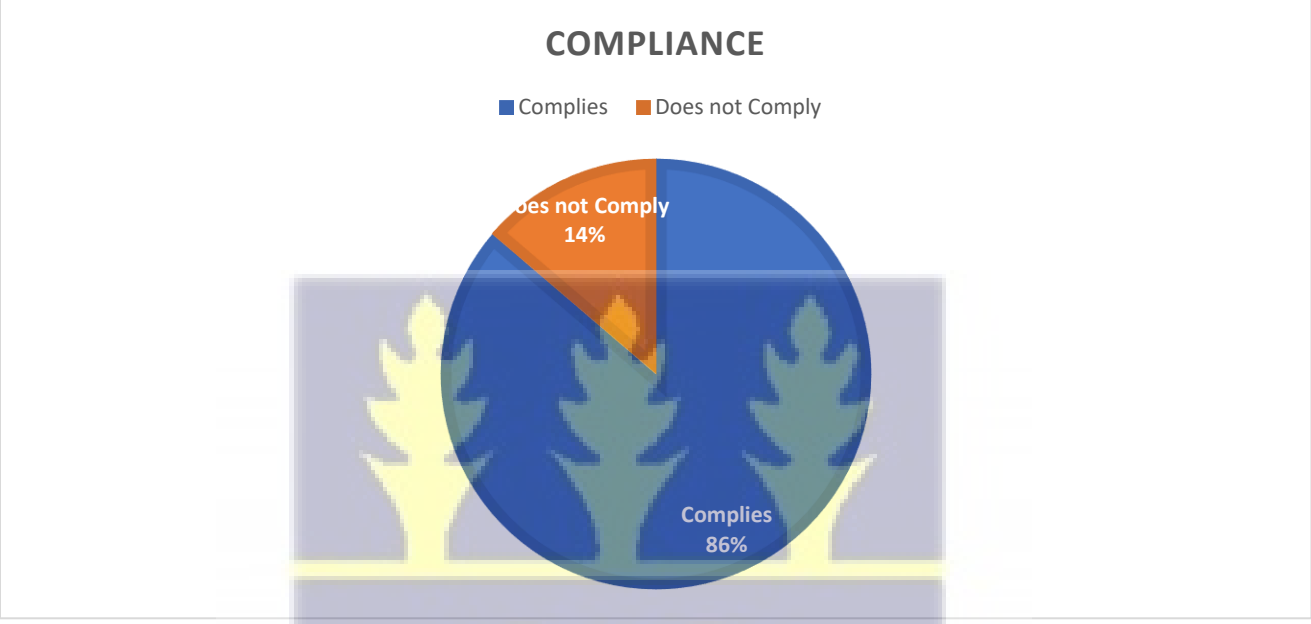

FIGURE 4.3 OVERALL COMPLIANCE OF ANALYZED HERBAL PRODUCTS WITH THE BRITISH PHARMACOPOEIA, 2022) (APPENDIX II) SPECIFICATIONS

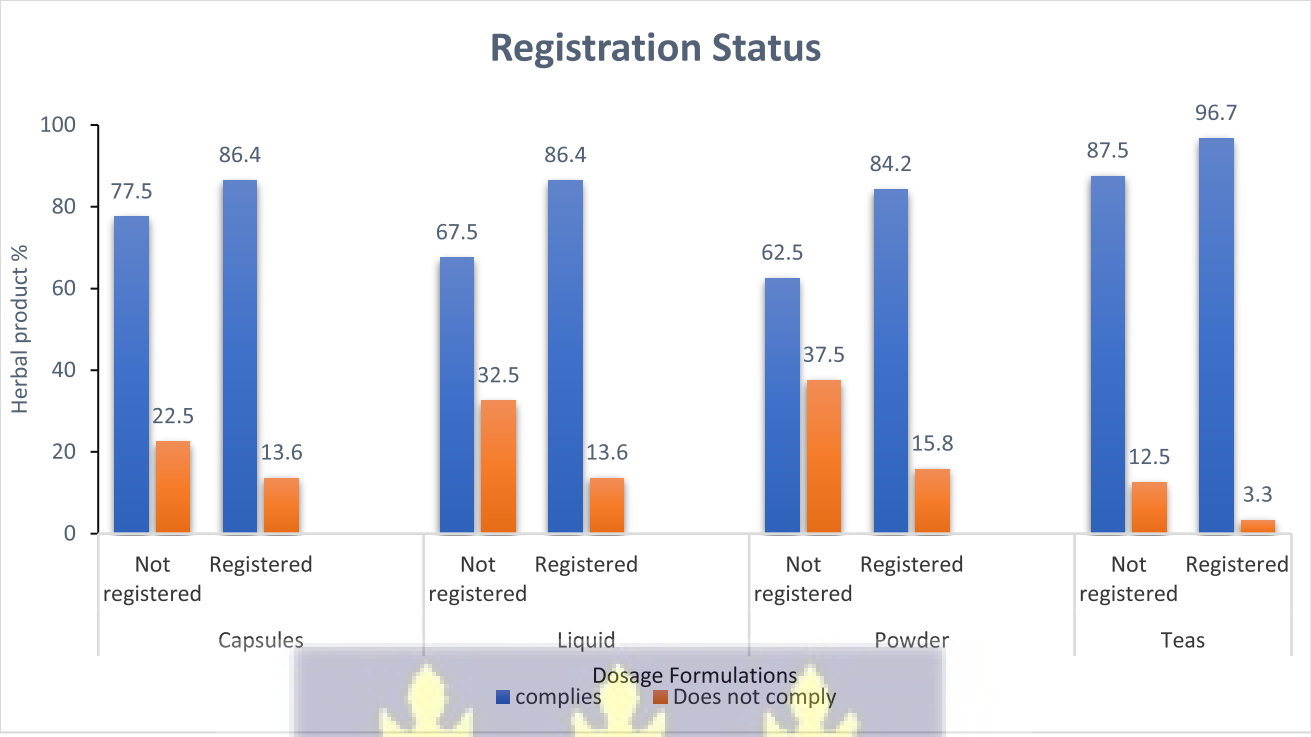

FIGURE 4.4 COMPLIANCE OF THE REGISTRATION STATUS OF THE VARIOUS DOSAGE FORMULATIONS OF HERBAL PRODUCTS WITH THE BRITISH PHARMACOPOEIA, 2022) (APPENDIX II) SPECIFICATIONS

4.5 Compliance of the different test of herbal formulations with the British Pharmacopoeia, 2022) (APPENDIX II) specifications

Figure 4.5, represents the compliance of the test with the different types of herbal formulations with compendial requirements. Teas recorded no presence of Escherichia coli and Salmonella spp. but recorded 13.9% and 5.6% for the Total Aerobic Microbial Count (TAMC) and Total Yeast and Mold Count (TYMC) respectively, which also represented the least among the four (4) formulations. Capsules came next recording 4% for Escherichia coli and 2% for Salmonella spp. TAMC recorded was 35% and TYMC was 11%. Powder recorded the most non-compliance in all the test, having 41.7% and 25% for the TAMC and TYMC respectively. It also recorded 8.3% and

2.8% for the Escherichia coli and Salmonella spp. respectively, followed by liquid formulation recording 33% and 17% for TAMC and TYMC; Escherichia coli and Salmonella spp. recorded 8% and 4% respectively.

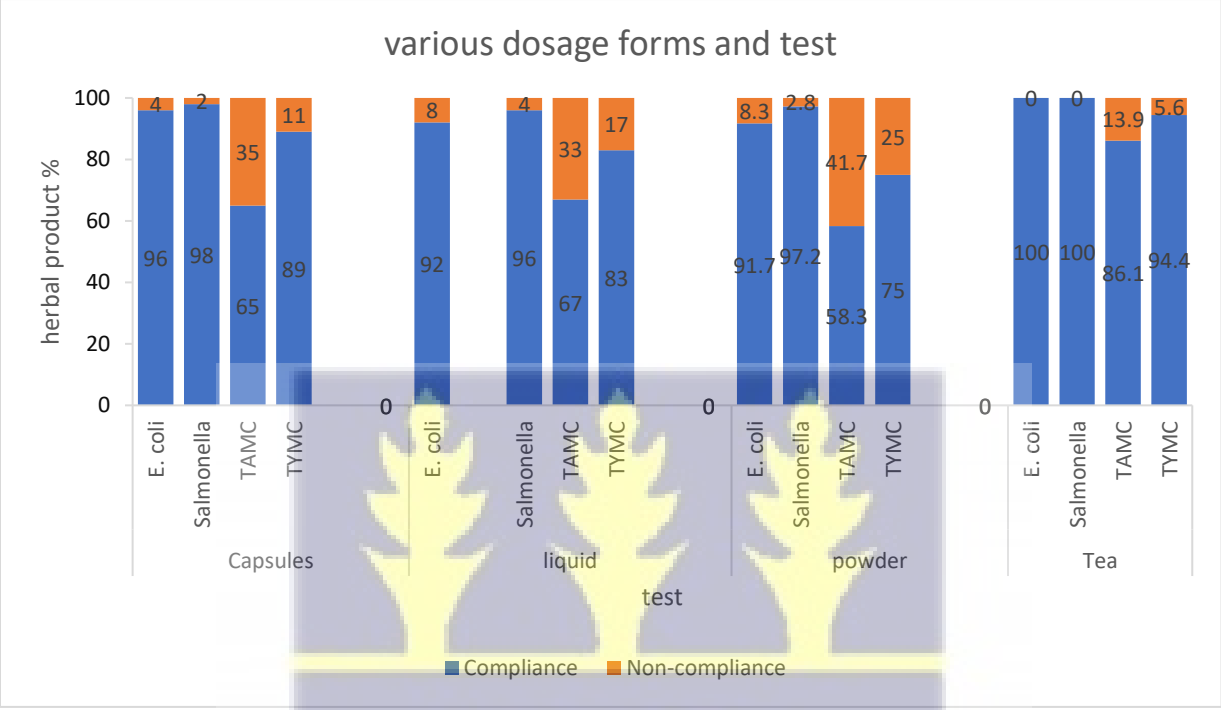

FIGURE 4.5 COMPLIANCE OF THE DIFFERENT TYPES OF HERBAL FORMULATIONS WITH THE BRITISH PHARMACOPOEIA, 2022) (APPENDIX II) SPECIFICATIONS

N.B (ABBREVIATIONS) **TAMC** Total Aerobic Microbial Count

TYMC Total Yeast and Mold Count

E. coli *Escherichia coli*

CHAPTER FIVE

DISCUSSION

The world has long been warned about the dangers of herbal medicines, but they continue to play an essential role in the treatment of minor and serious disorders in both industrialised and developing countries, where their use is increasing (Tamuno, Omole-Ohonsi, Fadare, 2010). The current study's findings reveal that herbal medical items promoted in Okaishie Drug Store Lane have high levels of contamination with harmful pathogens such as *Escherichia coli*, *Salmonella typhi*, and *Salmonella paratyphi A*. The presence of these bacteria in herbal medicines may pose a major health concern to both patients and the general public, necessitating increased surveillance and control of herbal medical goods in Ghana. Given that 38 (14%) of the 272 products evaluated were non-compliant with pharmacopeial specifications for microbial analysis (British Pharmacopoeia Commission, 2022) (APPENDIX II).

Herbal medicine tainted with hazardous microorganisms may increase the prevalence of healthcare-associated disorders, aggravate preexisting ailments, and increase consumer healthcare costs, putting an unnecessary load on public coffers. The findings of this investigation also revealed that the microbial load of the herbal items differed significantly. Bacteria and fungi infected the samples to varied degrees. Individual products satisfied the majority of the microbiological standards, while a handful did not pass the complete test. Powder formulations had a 19.4% non-compliance rate due to microbiological contamination from poor good manufacturing practices (GMPs) during preparation, handling, and storage; liquid formulations had a 15.5% non-compliance rate, which may be explained by the fact that a moist environment is conducive to microbial development when the product is improperly handled. The highest

compliance (95.1%) was seen with tea, followed by capsule-formulated medicines (87%). The minimal processing involved in the production of the tea dosage form is likely responsible for the low level of microbial contamination observed. The findings of the study indicate that teas and capsule formulations exhibit lower levels of microbial contamination in comparison to liquid and powder dose forms. This suggests that the utilization of teas and capsules could be a viable strategy for reducing microbial contamination in herbal medicines. When practicable, any of these two dose forms should be used in the creation of herbal medicines, and intentional efforts should be made to promote and help local herbalists in this endeavor. In general, the non-registered dosage forms have greater percentages of non-compliance, with the highest 37.5% representing powders, followed by liquid with 32.5% and capsules with 22.5%; teas have the lowest non-compliance of 12.5%. For the Registered, teas have the highest compliance of 96.7% and the lowest compliance of 62.2%; 15.8% is the highest that does not conform when it comes to the Registered items found in powders, followed by liquid and capsules both with a percentage of 13.6 and Teas with 3.3%.

As a result of the findings, registered items were shown to be safer, with lower levels of harmful microorganisms than FDA unregistered products. As a result, the findings advise herbal medicine sellers and users to choose FDA-approved items. Soil, harvesting, drying, storage conditions, and incorrect handling all have an impact on the microbiological purity of herbal medications, according to Nakajima et al., 2005. Non-sterile pharmaceutical products may be harmful to patients because of the possibility of diminished or eliminated therapeutic activity due to the presence of microbiological contaminants. The use of heavily polluted natural raw materials has been connected to the spread of some infectious diseases. The microbiological quality of medicines is affected by factors such as the conditions under which they were formulated and the standard of the raw materials used. Manufacturers shall guarantee the lowest practicable level of

microorganisms in raw materials, completed dosage forms, and packaging components to preserve proper product quality, safety, and efficacy.

Escherichia coli was the most common microbe isolated, accounting for 5.5% of the total in the herbals. Feces, soil, water, dust, and vegetation are the principal sources of Escherichia coli. Meanwhile, the British Pharmacopeia (2022) states that it should be absolutely absent in herbal preparations. Salmonella spp. was found in 2.6% of herbal products. Salmonella spp primary source is likewise faeces, dirt, water, and vegetations; hence, both primary sources of this microbe imply that the water used in the product's production was not from a good source or that the plant portion did not undergo appropriate GMP. The presence of any of these organisms in herbal products may also indicate contamination during harvesting, processing, transit, and storage, as well as poor cold chain maintenance. GMP compliance is thus critical for the production of high-quality herbal medications. GMP must be strictly followed throughout the entire production process, beginning with cultivation and ending with product sale (WHO, 2007). According to the findings of this study, 32.4% of participants surpassed B.P (2022) TAMC restrictions, whereas 14.3% exceeded B.P (2022) TYMC limits (APPENDIX II). Several investigations have found herbal items with microbe counts that exceed the compendial limit (Hossain et al., 2004; Gad et al., 2011; Hoq et al.,1991). Herbal products with bacteria loads more than the maximum authorised bioburden counts endanger customers' health.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

To summarize, herbal medicinal products have become a part of Ghana's healthcare delivery system. Consumers, on the other hand, can readily acquire pathogenic bacteria from contaminated herbal medicines. According to the findings of this study, all of the organisms identified had a high microbial count, indicating that they could be a source of infection. A notable proportion, specifically 14%, of individuals who consume herbal medicines from Okaishie Drug Store Lane are susceptible to the ingestion of infectious bacteria and fungi from products that are purportedly medicinal, it does not comply with the British Pharmacopeia (2022). As a result, the relevant regulatory authorities must amplify regulations to govern the preparation, use, and sale of herbal medicines. Product safety, efficacy, and quality are critical in disease treatment. Also, it was noted from the results that the Registered products can be said to be safe having less levels of pathogenic microbes than the FDA unregistered products. Therefore, the results recommend to sellers and users of herbal medicines to patronize FDA registered products.

6.1 Recommendations

The findings suggested that tea and capsule formulations of herbal medicines may provide a means of limiting microbial contamination in these therapies by being lower in microbial contamination than liquid and powder dose forms. The formulation of herbal medicines should prioritize either of these two dose types whenever possible, and local herbalists should be actively encouraged and supported in their efforts to do so. The pricey technology and equipment needed for tablet and capsule formulation puts it out of the reach of most herbalists. Collaboration with Ghana's Food and Drugs Authority (FDA), universities, and research institutes, on the other hand, could assist herbalists in meeting pharmacopeial requirements while also providing them with access to technological know-how.

The results also suggest that FDA registered products compared with Non-Registered products have low levels of microbial contamination therefore preferably best for consumption. Consumers should ensure products consumed are FDA registered.

Finally, future research should explored sampling directly from the manufacturing sites to assess microbial contamination of herbal products.

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APPENDICES

APPENDIX I: PERMIT TO USE FDA LABORATORY

FOOD AND DRUGS AUTHORITY
FDA
GHANA
Your Well-being, Our Priority.

Head Office
Mail: P.O. Box CT 2783, Cantonments-Accra, Ghana
(+233)-302-233200/235100
(+233)-551-112223/4/5 (Hotline)
Email: fda@fda.gov.gh
Digital Address: GA-237-7316

25th May 2022

The Head of Department
University of Ghana
Department of Biological, Environmental and Occupational Health
School of Public Health

Attention: Prof. Mawuli Dzodzomenyo

Dear Sir,

RE: REQUEST FOR LABORATORY SPACE FOR STUDENT (ANDREWS OWUSU YEBOAH)

I refer to your letter dated May 25th 2022, on the above subject and wish to inform you that the Microbiology Department of the Food and Drugs Authority (FDA) can accommodate Andrews as he conducts a study on " Microbiological Quality of Selected Herbal Medicinal Products sold at Okaihsie Drugs Lane, Ghana"

Please do not act hesitate to contact me should you require any further information.

Yours faithfully,

FOOD & DRUGS AUTHORITY
P.O. BOX CT 2783
CANTONMENTS

HARRIET AYEBEA OFORI – ANTWI
HEAD, MICROBIOLOGY DEPARTMENT
FOOD AND DRUGS AUTHORITY
ACCRA.

APPENDIX II: SPECIFICATIONS FROM COMPENDIAL

Summarized acceptance criteria for microbiological quality of herbal medicinal products for oral use

Criterion	Acceptance	
	Tea, Capsule and powder formulations	**Liquid formulations**
Enumeration test (Total viable count)		
▪ **Mean bacterial count**	Not more than five colonies at 10^7 dilutions	Not more than five colonies at 10^5 dilutions
▪ **Mean fungal count**	Not more than five colonies at 10^5 dilutions	Not more than five colonies at 10^3 dilutions
Test for Gram-negative coliforms		
▪ ***Escherichia coli***	Complete absence per gram of drug product	Complete absence per milliliter of drug product
▪ ***Salmonella***	Complete absence per 25 grams of drug product	Complete absence per 25 mL of drug product

Adapted from: *Appendix XVI G. Microbiological quality of herbal medicinal products for oral use (B.P., 2022).*

APPENDIX III: TEST RESULTS

sample id	Test	Results	Compliance statement
1L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.5 x 10^4 cfu/ml	Complies
1L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
1L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
1L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
2L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.4 x 10^6 cfu/ml	Does not comply
2L	Total Yeast and Mould Count /22.50C/7days/SDA	8.4 x 10^4 cfu/ml	Does not comply
2L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
2L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
3L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.8x10^3cfu/g	Complies
3L	Total Yeast and Mould Count /22.50C/7days/SDA	<10cfu/g	Complies
3L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
3L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
4L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	4.1 x 10^5 cfu/ml	Does not comply
4L	Total Yeast and Mould Count /22.50C/7days/SDA	7.3 x 10^4 cfu/ml	Does not comply
4L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
4L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
5L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
5L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
5L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
5L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
6L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
6L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
6L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
6L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
7L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/ml	Does not comply
7L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
7L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
7L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
8L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
8L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
8L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
8L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
9L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.2 x 10^5 cfu/ml	Does not comply
9L	Total Yeast and Mould Count /22.50C/7days/SDA	6.1 x 10^5 cfu/ml	Does not comply
9L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
9L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
10L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
10L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
10L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
10L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
12L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
12L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
12L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
12L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
13L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
13L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
13L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
13L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
14L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/ml	Does not comply
14L	Total Yeast and Mould Count /22.50C/7days/SDA	1.1 x 10^5 cfu/ml	Does not comply
14L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
14L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
15L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.7 x 10^5 cfu/ml	Does not comply
15L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
15L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
15L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
16L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
16L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
16L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
16L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies

17L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	3.5 x 10^5 cfu/ml	Does not comply
17L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
17L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
17L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
18L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
18L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
18L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
18L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
19L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
19L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
19L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
19L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
20L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
20L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
20L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
20L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
21L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.1 x 10^4 cfu/ml	Does not comply
21L	Total Yeast and Mould Count /22.50C/7days/SDA	4.6 x 10^4 cfu/ml	Does not comply
21L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
21L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
22L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.6 x 10^5 cfu/ml	Does not comply
22L	Total Yeast and Mould Count /22.50C/7days/SDA	1.7 x 10^4 cfu/ml	Does not comply
22L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
22L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
23L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/ml	Does not comply
23L	Total Yeast and Mould Count /22.50C/7days/SDA	5.7 x 10^4 cfu/ml	Does not comply
23L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
23L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
24L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
24L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
24L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
24L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
25L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.3 x 10^4 cfu/ml	Does not comply
25L	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/ml	Complies
25L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
25L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
26L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.2 x 10^5 cfu/ml	Does not comply
26L	Total Yeast and Mould Count /22.50C/7days/SDA	4.8 x 10^5 cfu/ml	Does not comply
26L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
26L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
27L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
27L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
27L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
27L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
28L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.2 x 10^5 cfu/ml	Does not comply
28L	Total Yeast and Mould Count /22.50C/7days/SDA	1.5 x 10^5 cfu/ml	Does not comply
28L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	Detected	Does not comply
28L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
29L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
29L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
29L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
29L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
30L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
30L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
30L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
30L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
31L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
31L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
31L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
31L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
32L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.4 x 10^5 cfu/ml	Does not comply
32L	Total Yeast and Mould Count /22.50C/7days/SDA	8.5 x 10^4 cfu/ml	Does not comply
32L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
32L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
33L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.5 x 10^4 cfu/ml	Does not comply

33L	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/ml	Complies
33L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
33L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
34L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
34L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
34L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
34L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
35L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	9.2 x 10^4 cfu/ml	Does not comply
35L	Total Yeast and Mould Count /22.50C/7days/SDA	7.2 x 10^4 cfu/ml	Does not comply
35L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	Detected	Does not comply
35L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
36L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	2.1x10^3cfu/g	Complies
36L	Total Yeast and Mould Count /22.50C/7days/SDA	<10cfu/g	Complies
36L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
36L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
37L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
37L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
37L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
37L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
38L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
38L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
38L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
38L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
39L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
39L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
39L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
39L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
40L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
40L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
40L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
40L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
41L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
41L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
41L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
41L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
42L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
42L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
42L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
42L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
43L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
43L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
43L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
43L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
44L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
44L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
44L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
44L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
45L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
45L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
45L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
45L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
46L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
46L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
46L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
46L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
47L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.3 x 10^6 cfu/ml	Does not comply
47L	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/ml	Complies
47L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
47L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
48L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
48L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
48L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
48L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
49L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
49L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies

49L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
49L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
50L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
50L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
50L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
50L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
51L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
51L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
51L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
51L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
52L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
52L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
52L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
52L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
53L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
53L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
53L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
53L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
54L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/ml*	*Does not comply*
54L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
54L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
54L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
55L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
55L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
55L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
55L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
56L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/ml*	*Does not comply*
56L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
56L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
56L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
57L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
57L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
57L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
57L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
58L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
58L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
58L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
58L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
59L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
59L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
59L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
59L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
60L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
60L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
60L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
60L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
61L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
61L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
61L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
61L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
62L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
62L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
62L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
62L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
63L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
63L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
63L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
63L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
64L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
64L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
64L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
64L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
65L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
65L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
65L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*

65L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
66L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
66L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
66L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
66L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
67L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
67L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
67L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
67L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
68L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
68L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
68L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
68L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
69L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.1 x 10^5 cfu/ml*	*Does not comply*
69L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*<10 cfu/ml*	*Complies*
69L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
69L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
70L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.3x10^3cfu/g*	*Complies*
70L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*<10cfu/g*	*Complies*
70L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
70L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*Detected*	*Does not comply*
71L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/ml*	*Does not comply*
71L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*5.7 x 10^5 cfu/ml*	*Does not comply*
71L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
71L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
72L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.5 x 10^4 cfu/ml*	*Does not comply*
72L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*3.3 x 10^4 cfu/ml*	*Does not comply*
72L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*Detected*	*Does not comply*
72L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*Detected*	*Does not comply*
73L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
73L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
73L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
73L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
74L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
74L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
74L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
74L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
75L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
75L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
75L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
75L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
76L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
76L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
76L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
76L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
77L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
77L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
77L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
77L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
78L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
78L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
78L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
78L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
79L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*7.9 x 10^4 cfu/ml*	*Does not comply*
79L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
79L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
79L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
80L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
80L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
80L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
80L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
81L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/ml*	*Does not comply*
81L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
81L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
81L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*

82L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
82L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
82L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
82L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
83L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
83L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
83L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
83L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
84L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
84L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
84L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
84L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
85L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
85L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
85L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
85L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
86L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
86L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
86L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
86L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
87L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
87L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
87L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
87L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
88L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.1×10^4 cfu/ml	Does not comply
88L	Total Yeast and Mould Count /22.50C/7days/SDA	4.3×10^4 cfu/ml	Does not comply
88L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
88L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
89L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	$>3.0 \times 10^6$ cfu/ml	Does not comply
89L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
89L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
89L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
90L	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
90L	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
90L	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
90L	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
91Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
91Ln	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
91Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
91Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
92Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.4×10^4 cfu/ml	Does not comply
92Ln	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
92Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
92Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
93Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	$>3.0 \times 10^6$ cfu/ml	Does not comply
93Ln	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
93Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
93Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
94Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
94Ln	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
94Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
94Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
95Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.9×10^5cfu/ml	Does not comply
95Ln	Total Yeast and Mould Count /22.50C/7days/SDA	4.6×10^5 cfu/ml	Does not comply
95Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
95Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
96Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/ml	Complies
96Ln	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/ml	Complies
96Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
96Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
97Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	$>3.0 \times 10^6$ cfu/ml	Does not comply
97Ln	Total Yeast and Mould Count /22.50C/7days/SDA	$>2.0 \times 10^6$ cfu/ml	Does not comply
97Ln	Salmonella/32.50C/24hrs/BPW/RVS/XLD	Detected	Does not comply
97Ln	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
98Ln	Total Aerobic Microbial Count/32.50C/72hrs/TSA	$>3.0 \times 10^6$ cfu/ml	Does not comply

98Ln	*Total Yeast and Mould Count /22.50C/7days/SDA*	*>2.0 x 10^6 cfu/ml*	*Does not comply*
98Ln	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
98Ln	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
99Ln	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/ml*	*Does not comply*
99Ln	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
99Ln	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
99Ln	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
100Ln	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.4 x 10^4 cfu/ml*	*Does not comply*
100Ln	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
100Ln	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
100Ln	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
101T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.1 x 10^5 cfu/g*	*Complies*
101T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
101T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
101T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10*	*Complies*
102T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
102T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
102T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
102T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
103T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
103T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
103T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
103T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
104T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.7 x 10^3 cfu/g*	*Complies*
104T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
104T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
104T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
105T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
105T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
105T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
105T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
106T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
106T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
106T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
106T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
107T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.2 x 10^3cfu/g*	*Complies*
107T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*5.5 x 10^2cfu/g*	*Complies*
107T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
107T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
108T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.3 x 10^4 cfu/g*	*Complies*
108T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
108T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
108T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
109T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.5 x 10^3cfu/g*	*Complies*
109T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*3.8 x 10^3cfu/g*	*Complies*
109T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
109T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
110T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
110T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
110T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
110T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
111T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.2 x 10^5 cfu/g*	*Complies*
111T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
111T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
111T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
112T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
112T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
112T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
112T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
113T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
113T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
113T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
113T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
114T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
114T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*

114T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
114T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
115T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.2 x 10^5 cfu/g*	*Complies*
115T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10cfu/g*	*Complies*
115T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
115T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10cfu/g*	*Complies*
116T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.3 x 10^4 cfu/g*	*Complies*
116T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
116T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
116T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10cfu/g*	*Complies*
117T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.4 x 10^5 cfu/g*	*Complies*
117T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10cfu/g*	*Complies*
117T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
117T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10cfu/g*	*Complies*
118T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*9.0 x 10^3 cfu/g*	*Complies*
118T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
118T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
118T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
119T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
119T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
119T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
119T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
120T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.8 x 10^7 cfu/g*	*Does not comply*
120T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*6.9 x 10^6 cfu/g*	*Does not comply*
120T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
120T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
121T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
121T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
121T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
121T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
122T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
122T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
122T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
122T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
123T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.8 x 10^4 cfu/g*	*Complies*
123T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
123T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
123T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
124T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
124T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
124T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
124T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
125T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.1 x 10^7 cfu/g*	*Does not comply*
125T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*7.1 x 10^6 cfu/g*	*Does not comply*
125T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
125T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
126T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
126T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
126T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
126T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
127T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.9 x 10^4 cfu/g*	*Complies*
127T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
127T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
127T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
128T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
128T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
128T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
128T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
129T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
129T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
129T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
129T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
130T	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.1 x 10^3 cfu/g*	*Complies*
130T	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
130T	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*

130T	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
131Tn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.2 x 10^3 cfu/g*	*Complies*
131Tn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
131Tn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
131Tn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
132Tn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.8 x 10^3 cfu/g*	*Complies*
132Tn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
132Tn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
132Tn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
133Tn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^7 cfu/g*	*Does not comply*
133Tn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
133Tn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
133Tn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
134Tn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^7 cfu/g*	*Does not comply*
134Tn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
134Tn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
134Tn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*<10 cfu/g*	*Complies*
135Tn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.4 x 10^5 cfu/g*	*Complies*
135Tn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*9.8 x 10^3 cfu/g*	*Complies*
135Tn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
135Tn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
136Tn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^7 cfu/g*	*Does not comply*
136Tn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
136Tn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
136Tn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
137P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
137P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
137P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
137P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*< 10 cfu/g*	*Complies*
138P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.5 x 10^4 cfu/g*	*Complies*
138P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*1.8 x 10^4 cfu/g*	*Complies*
138P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
138P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
139P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.3 x 10^3 cfu/g*	*Complies*
139P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
139P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
139P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
140P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.8 x 10^5 cfu/g*	*Does not comply*
140P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*5.0 x 10^5 cfu/g*	*Does not comply*
140P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
140P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
141P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.1 x 10^5 cfu/g*	*Does not comply*
141P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*4.1 x 10^5 cfu/g*	*Does not comply*
141P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
141P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
142P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.3 x 10^3 cfu/g*	*Complies*
142P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
142P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
142P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
143P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*9.5 x 10^6 cfu/g*	*Does not comply*
143P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*5.1 x 10^4 cfu/g*	*Does not comply*
143P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
143P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
144P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*7.1 x 10^5 cfu/g*	*Does not comply*
144P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
144P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
144P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
145P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.0 x 10^3 cfu/g*	*Complies*
145P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
145P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
145P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
146P	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.0 x 10^6 cfu/g*	*Does not comply*
146P	*Total Yeast and Mould Count /22.50C/7days/SDA*	*7.6 x 10^5 cfu/g*	*Does not comply*
146P	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
146P	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*

147P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.6 x 10^5 cfu/g	Does not comply
147P	Total Yeast and Mould Count /22.50C/7days/SDA	5.1 x 10^5 cfu/g	Does not comply
147P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
147P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
148P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.8 x 10^3 cfu/g	Complies
148P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
148P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
148P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	<10 cfu/g	Complies
149P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.3 x 10^4cfu/g	Complies
149P	Total Yeast and Mould Count /22.50C/7days/SDA	3.8 x 10^4cfu/g	Complies
149P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
149P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
150P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
150P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
150P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
150P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
151P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
151P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
151P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
151P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
152P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
152P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
152P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
152P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
153P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.5 x 10^4 cfu/g	Complies
153P	Total Yeast and Mould Count /22.50C/7days/SDA	1.8 x 10^4 cfu/g	Complies
153P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
153P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
154P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
154P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
154P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
154P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
155P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
155P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
155P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
155P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
156P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
156P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
156P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
156P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
157P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
157P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
157P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
157P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
158P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.0 x 10^3 cfu/g	Complies
158P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
158P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
158P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
159P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.0 x 10^6 cfu/g	Does not comply
159P	Total Yeast and Mould Count /22.50C/7days/SDA	5.8 x 10^4 cfu/g	Does not comply
159P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
159P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
160P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
160P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
160P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
160P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
161P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
161P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
161P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
161P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
162P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	4.9 x 10^5 cfu/g	Complies
162P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
162P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
162P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
163P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	3.5 x 10^6 cfu/g	Does not comply

163P	Total Yeast and Mould Count /22.50C/7days/SDA	5.1 x 10^4 cfu/g	Does not comply
163P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
163P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
164P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	4.3 x 10^6 cfu/g	Does not comply
164P	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/g	Complies
164P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
164P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
165P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.7 x 10^5 cfu/g	Does not comply
165P	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/g	Complies
165P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
165P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
166P	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^7 cfu/g	Does not comply
166P	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
166P	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
166P	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
167Pn	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^7 cfu/g	Does not comply
167Pn	Total Yeast and Mould Count /22.50C/7days/SDA	9.4 x 10^4 cfu/g	Does not comply
167Pn	Salmonella/32.50C/24hrs/BPW/RVS/XLD	Detected	Does not comply
167Pn	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
168Pn	Total Aerobic Microbial Count/32.50C/72hrs/TSA	4.2 x 10^5 cfu/g	Complies
168Pn	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
168Pn	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
168Pn	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
169Pn	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^7 cfu/g	Does not comply
169Pn	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
169Pn	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
169Pn	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
170Pn	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
170Pn	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
170Pn	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
170Pn	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
171Pn	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^7 cfu/g	Does not comply
171Pn	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
171Pn	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
171Pn	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
172Pn	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.9 x 10^5 cfu/g	Does not comply
172Pn	Total Yeast and Mould Count /22.50C/7days/SDA	5.5 x 10^4 cfu/g	Does not comply
172Pn	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
172Pn	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
173C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.2 x 10^4 cfu/g	Complies
173C	Total Yeast and Mould Count /22.50C/7days/SDA	5.8 x 10^3 cfu/g	Complies
173C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
173C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
174C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
174C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
174C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
174C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
175C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
175C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
175C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
175C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
176C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	3.6 x 10^4 cfu/g	Complies
176C	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/g	Complies
176C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
176C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
177C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/g	Does not comply
177C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
177C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
177C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
178C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.8 x 10^4 cfu/g	Complies
178C	Total Yeast and Mould Count /22.50C/7days/SDA	6.3 x 10^3 cfu/g	Complies
178C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
178C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
179C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
179C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies

179C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
179C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
180C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
180C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
180C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
180C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
181C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
181C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
181C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
181C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*
182C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.8×10^5 cfu/g*	*Does not comply*
182C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*1.2×10^4 cfu/g*	*Complies*
182C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
182C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
183C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*7.0×10^5 cfu/g*	*Does not comply*
183C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*2.8×10^5 cfu/g*	*Does not comply*
183C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
183C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
184C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*$>3.0 \times 10^6$ cfu/g*	*Does not comply*
184C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*4.6×10^4 cfu/g*	*Complies*
184C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
184C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
185C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
185C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
185C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
185C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
186C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.0×10^6 cfu/g*	*Does not comply*
186C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*3.2×10^4 cfu/g*	*Complies*
186C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
186C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
187C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.7×10^5 cfu/g*	*Does not comply*
187C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
187C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
187C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
188C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
188C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
188C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
188C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
189C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
189C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
189C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
189C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
190C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.7×10^5 cfu/g*	*Does not comply*
190C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
190C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
190C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*Detected*	*Does not comply*
191C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.3×10^4 cfu/g*	*Complies*
191C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
191C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
191C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
193C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.2×10^5 cfu/g*	*Complies*
193C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*3.2×10^3 cfu/g*	*Complies*
193C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
193C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
194C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*$>3.0 \times 10^6$ cfu/g*	*Does not comply*
194C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
194C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
194C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
195C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.2×10^5 cfu/g*	*Complies*
195C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
195C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
195C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
196C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.9×10^4 cfu/g*	*Complies*
196C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
196C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*

196C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
197C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.2 x 10^5 cfu/g*	*Does not comply*
197C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
197C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
197C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
198C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.4 x 10^4 cfu/g*	*Complies*
198C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
198C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
198C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
199C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
199C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
199C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
199C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
200C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*8.3 x 10^3 cfu/g*	*Complies*
200C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
200C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
200C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
201C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.1 x 10^4 cfu/g*	*Complies*
201C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
201C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
201C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
202C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*7.9 x 10^3 cfu/g*	*Complies*
202C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
202C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
202C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
203C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.2 x 10^4 cfu/g*	*Complies*
203C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
203C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
203C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
204C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.4 x 10^3 cfu/g*	*Complies*
204C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
204C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
204C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
205C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
205C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
205C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
205C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
206C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
206C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
206C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
206C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
207C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*6.4 x 10^3 cfu/g*	*Complies*
207C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
207C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
207C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
208C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*1.1 x 10^4 cfu/g*	*Complies*
208C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
208C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
208C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
209C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*7.8 x 10^5 cfu/g*	*Does not comply*
209C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
209C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
209C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
210C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
210C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
210C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
210C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
211C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
211C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
211C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
211C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
212C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 1.3 x 10^4 cfu/g*	*Complies*
212C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
212C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
212C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*

213C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
213C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
213C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
213C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
214C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.8×10^5 cfu/g	Does not comply
214C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
214C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
214C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
215C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.5×10^5 cfu/g	Does not comply
215C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
215C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
215C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
216C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	4.7×10^5 cfu/g	Complies
216C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
216C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
216C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
217C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.4×10^4 cfu/g	Complies
217C	Total Yeast and Mould Count /22.50C/7days/SDA	4.0×10^4 cfu/g	Complies
217C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
217C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
218C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.2×10^3 cfu/g	Complies
218C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
218C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
218C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
219C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.5×10^5 cfu/g	Does not comply
219C	Total Yeast and Mould Count /22.50C/7days/SDA	9.2×10^3 cfu/g	Complies
219C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
219C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
220C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.7×10^5 cfu/g	Does not comply
220C	Total Yeast and Mould Count /22.50C/7days/SDA	6.0×10^4 cfu/g	Does not comply
220C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
220C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
221C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.3×10^3 cfu/g	Complies
221C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
221C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
221C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
222C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.8×10^4 cfu/g	Complies
222C	Total Yeast and Mould Count /22.50C/7days/SDA	1.7×10^4 cfu/g	Complies
222C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
222C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
223C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.1×10^4 cfu/g	Complies
223C	Total Yeast and Mould Count /22.50C/7days/SDA	1.7×10^4 cfu/g	Complies
223C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
223C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
224C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.0×10^4 cfu/g	Complies
224C	Total Yeast and Mould Count /22.50C/7days/SDA	4.3×10^4 cfu/g	Complies
224C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
224C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
225C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.0×10^4 cfu/g	Complies
225C	Total Yeast and Mould Count /22.50C/7days/SDA	5.1×10^4 cfu/g	Does not comply
225C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
225C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
226C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.4×10^4 cfu/g	Complies
226C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
226C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
226C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
227C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	9.6×10^3 cfu/g	Complies
227C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
227C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
227C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
228C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.4×10^5 cfu/g	Complies
228C	Total Yeast and Mould Count /22.50C/7days/SDA	6.0×10^4 cfu/g	Does not comply
228C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
228C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
229C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies

229C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
229C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
229C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
230C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.7 x 10^5 cfu/g	Does not comply
230C	Total Yeast and Mould Count /22.50C/7days/SDA	9.2 x 10^3 cfu/g	Complies
230C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
230C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
231C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	1.2 x 10^5 cfu/g	Complies
231C	Total Yeast and Mould Count /22.50C/7days/SDA	7.7 x 10^3 cfu/g	Complies
231C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
231C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
232C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
232C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
232C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
232C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
233C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
233C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
233C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
233C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
234C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.9 x 10^5 cfu/g	Does not comply
234C	Total Yeast and Mould Count /22.50C/7days/SDA	8.6 x 10^5 cfu/g	Does not comply
234C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
234C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
235C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/g	Does not comply
235C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
235C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
235C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
236C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
236C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
236C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
236C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
237C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
237C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
237C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
237C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
238C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.1 x 10^5 cfu/g	Does not comply
238C	Total Yeast and Mould Count /22.50C/7days/SDA	4.6 x 10^5 cfu/g	Does not comply
238C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
238C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None Detected	Complies
239C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.3 x 10^4 cfu/g	Complies
239C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
239C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
239C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
240C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.8 x 10^4 cfu/g	Complies
240C	Total Yeast and Mould Count /22.50C/7days/SDA	<10 cfu/g	Complies
240C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
240C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
241C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
241C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
241C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
241C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
242C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
242C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
242C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
242C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
243C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.1 x 10^5 cfu/g	Does not comply
243C	Total Yeast and Mould Count /22.50C/7days/SDA	5.2 x 10^5 cfu/g	Does not comply
243C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
243C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
244C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.0 x 10^5 cfu/g	Does not comply
244C	Total Yeast and Mould Count /22.50C/7days/SDA	5.0 x 10^4 cfu/g	Complies
244C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
244C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
245C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
245C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies

245C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
245C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
246C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	6.1 x 10^5 cfu/g	Does not comply
246C	Total Yeast and Mould Count /22.50C/7days/SDA	4.2 x 10^5 cfu/g	Does not comply
246C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
246C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
247C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
247C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
247C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
247C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
248C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.1 x 10^5 cfu/g	Does not comply
248C	Total Yeast and Mould Count /22.50C/7days/SDA	2.3 x 10^5 cfu/g	Does not comply
248C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
248C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
249C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
249C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
249C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
249C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
250C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
250C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
250C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
250C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
251C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
251C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
251C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
251C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
252C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/g	Does not comply
252C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
252C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
252C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
253C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.4 x 10^4 cfu/g	Complies
253C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
253C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
253C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
254C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/g	Does not comply
254C	Total Yeast and Mould Count /22.50C/7days/SDA	5.8 x 10^5 cfu/g	Does not comply
254C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	Detected	Does not comply
254C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
255C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	8.2 x 10^4 cfu/g	Complies
255C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
255C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
255C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
256C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	4.4 x 10^3 cfu/g	Complies
256C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
256C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
256C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
257C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	5.1 x 10^4 cfu/g	Complies
257C	Total Yeast and Mould Count /22.50C/7days/SDA	4.6 x 10^4 cfu/g	Complies
257C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
257C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	Detected	Does not comply
258C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
258C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
258C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
258C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
259C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	>3.0 x 10^6 cfu/g	Does not comply
259C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
259C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
259C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
260C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	< 10 cfu/g	Complies
260C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
260C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies
260C	E. coli/32.50C/48hrs/BSPW/TSB/MB/MA	None detected	Complies
261C	Total Aerobic Microbial Count/32.50C/72hrs/TSA	7.4 x 10^4 cfu/g	Complies
261C	Total Yeast and Mould Count /22.50C/7days/SDA	< 10 cfu/g	Complies
261C	Salmonella/32.50C/24hrs/BPW/RVS/XLD	None detected	Complies

261C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
262C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
262C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
262C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
262C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
263Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
263Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
263Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
263Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
264Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.3 x 10^5 cfu/g*	*Does not comply*
264Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*<10 cfu/g*	*Complies*
264Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
264Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
265Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*3.6 x 10^4 cfu/g*	*Complies*
265Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
265Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
265Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
266Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
266Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*6.1 x 10^4 cfu/g*	*Does not comply*
266Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
266Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
267Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
267Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
267Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
267Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
268Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
268Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
268Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
268Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
269Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
269Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
269Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
269Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
270Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*4.7 x 10^4 cfu/g*	*Complies*
270Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
270Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
270Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
271Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*>3.0 x 10^6 cfu/g*	*Does not comply*
271Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
271Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
271Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
272Cn	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*5.8 x 10^5 cfu/g*	*Does not comply*
272Cn	*Total Yeast and Mould Count /22.50C/7days/SDA*	*<10 cfu/g*	*Complies*
272Cn	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*Detected*	*Does not comply*
272Cn	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
273C	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/g*	*Complies*
273C	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/g*	*Complies*
273C	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
273C	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None detected*	*Complies*
274L	*Total Aerobic Microbial Count/32.50C/72hrs/TSA*	*< 10 cfu/ml*	*Complies*
274L	*Total Yeast and Mould Count /22.50C/7days/SDA*	*< 10 cfu/ml*	*Complies*
274L	*Salmonella/32.50C/24hrs/BPW/RVS/XLD*	*None detected*	*Complies*
274L	*E. coli/32.50C/48hrs/BSPW/TSB/MB/MA*	*None Detected*	*Complies*

L-Liquid dosage *T-Tea dosage* *P-Powder dosage* *C-Capsule dosage*
Ln-Liquid (unregistered) *Tn-Tea(unregistered)* *Pn-Powder(unregistered)* *Cn-Capsule(unregistered)*

APPENDIX IV: SAMPLE SITES AND COORDINATES

Herbal Sample Code	Sites code	Area Coodinate (Latitude)	Area Coodinate (Longitude)
1L,2L,54L,55L,67L,68L,100Ln	PLZ 1	5.5480	-0.20977
3L,4L,56L,57L,84L,96Ln	2	5.5475	-0.21013
5L,6L,7L,8L,83L,91Ln,92Ln,93Ln	3	5.5468	-0.20979
9L,10L,53L,88L,89L,94Ln,95Ln	4	5.5479	-0.20935
11L,12L,58L,82L,96Ln,98Ln,99Ln	5	5.5481	-0.20938
13L,14L,59L,60L	6	5.5484	-0.20941
15L,16L,17L,18L,274L	7	5.5485	-0.20943
19L,20L,30L,31L	8	5.5479	-0.20928
32L,33L,34L,35L,80L	9	5.5486	-0.20911
36L,37L,61L,62L,81L	10	5.5487	-0.20934
38L,39L,63L,64L,69L,70L	11	5.5485	-0.20940
40L,41L,65L,66L,90L	12	5.5477	-0.20982
42L,43L,44L,85L,86,	13	5.5478	-0.20982
45L,46L,47L,48L,87	14	5.5474	-0.20990
49L,50L,51L,52L	15	5.5474	-0.21006
101T,102T	PLZ 1	5.5480	-0.20977
103T,106T,127T	2	5.5475	-0.21013
104T,105T,108T	3	5.5468	-0.20979
109T,126T	4	5.5479	-0.20935
110T,128T	5	5.5481	-0.20938
111T	6	5.5484	-0.20941
112T	7	5.5485	-0.20943
113T,129T	8	5.5479	-0.20928
114T,134Tn	9	5.5486	-0.20911
115T,135Tn,136Tn	10	5.5487	-0.20934
117T,130T	11	5.5485	-0.20940
118T,120T	12	5.5477	-0.20982
119T,122T	13	5.5478	-0.20982
121T,131Tn,132Tn,133Tn	14	5.5474	-0.20990
123T,124T,125T	15	5.5474	-0.21006

137P,138P,139P	PLZ 1	5.5480	-0.20977
140P,141P	2	5.5475	-0.21013
142P,161P,162P	3	5.5468	-0.20979
143P,170Pn,171Pn	4	5.5479	-0.20935
144P,169Pn	5	5.5481	-0.20938
145P,163P	6	5.5484	-0.20941
146P,164P,166P	7	5.5485	-0.20943
147P,159P	8	5.5479	-0.20928
148P,160P	9	5.5486	-0.20911
149P,167Pn	10	5.5487	-0.20934
150P,151P,152P,168Pn	11	5.5485	-0.20940
153P,154P	12	5.5477	-0.20982
155P,172Pn	13	5.5478	-0.20982
156P	14	5.5474	-0.20990
157P,158P	15	5.5474	-0.21006
173C,174C,175C,237C,238C,253C,254C	PLZ 1	5.5480	-0.20977
176C,177C,178C,228C,229C,251C,252C	2	5.5475	-0.21013
179C,180C,181C,182C,246C,247C,248C	3	5.5468	-0.20979
183C,184C,185C,239C,240C,265Cn,268Cn	4	5.5479	-0.20935
186C,187C,217C,218C,219C,220C,271Cn	5	5.5481	-0.20938
188C,189C,190C,230C,243C,263Cn,264Cn	6	5.5484	-0.20941
191C,192C,212C,234C,246C,267Cn	7	5.5485	-0.20943
193C,194C,215C,216C,235C,236C,272Cn	8	5.5479	-0.20928
195C,210C,211C,231C,232C,265Cn,266Cn	9	5.5486	-0.20911
196C,213C,214C,241C,242C,261C,262C	10	5.5487	-0.20934
197C,198C,199C,233C,249C,250C,273Cn	11	5.5485	-0.20940
200C,201C,221C,222C,244C,245C	12	5.5477	-0.20982
202C,223C,224C,225C,255C,256C,257C	13	5.5478	-0.20982
203C,204C,205C,206C,234C,269Cn,270Cn	14	5.5474	-0.20990
207C,208C,209C,226C,227C,258C,259C,269C	15	5.5474	-0.21006

L-Liquid dosage *T-Tea dosage* *P-Powder dosage* *C-Capsule dosage*
Ln-Liquid (unregistered) *Tn-Tea(unregistered)* *Pn-Powder(unregistered)* *Cn-Capsule(unregistered)*