UNIVERSIDADE ESTADUAL PAULISTA

FACULDADE DE MEDICINA VETERINÁRIA E ZOOTECNIA

# AVALIAÇÃO MICROBIOLÓGICA EM UNIDADE DE NUTRIÇÃO E ALIMENTAÇÃO HOSPITALAR ANTES E APÓS INTERVENÇÃO NAS BOAS PRÁTICAS DE FABRICAÇÃO

DIONICE CAPISTRANO DA SILVA

Botucatu – SP

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DIONICE CAPISTRANO DA SILVA

Dissertação apresentada junto ao Programa de Pós-Graduação em Medicina Veterinária para a obtenção do título de Mestre.

Orientador: Prof. Dr. Juliano Gonçalves Pereira

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*Dedico esta dissertação à minha filha Elisa Capistrano.*

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# LISTA DE SÍMBOLOS E ABREVIATURAS

**AC** = *after the cleaning moment*
**ANVISA** = Agência Nacional de Vigilância Sanitária
**AMC** = *aerobic mesophilic count*
**APPCC** = Análise de Perigos e Pontos Críticos de Controle
**BC** = *Bacillus cereus*
**BPF** = Boas Práticas de Fabricação
**C** = *compliant*
**CFU** = *count forming unit*
**CVS** = Centro de Vigilância Sanitária
**DOA** = doença de origem alimentar
**DS** = *during the shift moment*
**EB** = *Enterobacteriaceae* count
**EC** = *Escherichia coli*
**EN** = *Enterococcus* sp.
**FC** = *surface with food contact*
**FD** = *foodborne disease*
**GMP** = *Good Manufacturing Practices*
**HACCP** = Hazard Analysis and Critical Control Points
**IRAS** = infecções associadas à assistência à saúde
**LM** = *Listeria monocytogenes*
**NC** = *non-compliant*
**OMS** = Organização Mundial da Saúde
**PCC** = ponto crítico de controle
**PNPCIRAS** = Programa Nacional de Prevenção e Controle das Infecções Relacionadas à Assistência à Saúde
**POP** = procedimento operacional padrão
**PPHO** = procedimento padrão de higiene operacional
**PPR** = programa de pré-requisitos
**PS** = *Pseudomonas* sp.
**PSO** = procedimento sanitário operacional
**RDC** = resolução da diretoria colegiada
**RM** = resistência microbiana
**SS** = *Salmonella* sp.
**ST+** = *Staphylococcus* coagulase-positiva
**UFC** = unidade formadora de colônia
**UANH** = Unidades de Alimentação e Nutrição Hospitalar
**WFC** = *surface without food contact*
**YM** = yeasts and molds

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SILVA, D.C. **Avaliação microbiológica em unidade de nutrição e alimentação hospitalar antes e após intervenção nas Boas Práticas de Fabricação.** Botucatu, 2023. 66p. Dissertação (Mestrado) – Faculdade de Medicina Veterinária e Zootecnia, Campus Botucatu, Universidade Estadual Paulista.

## RESUMO

Doenças veiculadas por alimentos podem agravar o quadro clínico de pacientes. O objetivo do estudo foi avaliar a capacidade da Unidade de Alimentação e Nutrição Hospitalar (UANH) em reduzir contagens bacterianas e garantir a inocuidade dos alimentos através das Boas Práticas de Fabricação (BPF). Em seis meses, dois *checklist* de BPF seguidos de amostragens microbiológicas foram realizados. Falhas de limpeza e de higiene foram constatadas em todas as áreas. Após a aplicação do plano de ação, as conformidades em BPF aumentou de 55,55% para 69,63%. As contagens de Microrganismos Aeróbios Mesófilos (AMC), bactérias da família *Enterobacteriaceae* (EB), e a detecção de *Listeria monocytogenes* (LM) sorotipos 4b, 1/2a e 1/2b revelaram que superfícies de manipulação de matérias primas foram as mais preocupantes. A melhoria nas BPF reduziu significativamente as contagens de AMC ($p<0,05$), que variaram de 2,61 a 4,69 log UFC/superfície antes, e de 0,48 a 2,55 log UFC/superfície após a intervenção. Ar, água, matérias primas e insumos, alimentos, e mãos também foram analisados, e, apesar de alguns resultados terem se mostrado não-conformes, todos os alimentos prontos para o consumo estavam inócuos. Após treinamentos, os manipuladores demonstraram higienização satisfatória das mãos. As comparações antes e depois da intervenção revelaram que houve redução significativa nas contagens bacterianas dos microrganismos indicadores de higiene. Conclui-se que a avaliação sistemática das BPF associada com a caracterização microbiológica das áreas de produção da cozinha hospitalar são ferramentas fundamentais na constatação dos perigos biológicos que estão envolvidos em cada processo dentro da UANH.

**Palavras-chave:** paciente, doenças de veiculação hídrica e alimentar, superfícies, Análise de Perigos e Pontos Críticos de Controle.

SILVA, D.C. **Microbiological assessment of a hospital kitchen before and after Good Manufacturing Practices intervention.** Botucatu, 2023. 66p. Dissertação (Mestrado) – Faculdade de Medicina Veterinária e Zootecnia, Campus Botucatu, Universidade Estadual Paulista.

## ABSTRACT

Food-borne diseases can worsen the clinical condition of patients. The objective of the study was to evaluate the capacity of the Hospital Food and Nutrition Unit (UANH) to reduce bacterial counts and guarantee food safety through Good Manufacturing Practices (GMP). Over six months, two GMP *checklist* followed by microbiological sampling were performed. Cleaning and hygiene failures were found in all areas. After the implementation of the action plan, GMP compliance increased from 55.55% to 69.63%. Counts of Aerobic Mesophilic Microorganisms (AMC), bacteria of the *Enterobacteriaceae* family (EB), and detection of *Listeria monocytogenes* (LM) serotypes 4b, 1/2a and 1/2b revealed that raw material handling surfaces were of the most concern. Improved GMP significantly reduced AMC counts ($p<0.05$), which ranged from 2.61 to 4.69 log CFU/surface before, and from 0.48 to 2.55 log CFU/surface after the intervention. Air, water, raw materials and inputs, food, and hands were also analyzed, and although some results proved non-compliant, all ready-to-eat foods were innocuous. After training, the handlers demonstrated satisfactory hand hygiene. Comparisons before and after the intervention revealed that there was a significant reduction in bacterial counts of hygiene indicator microorganisms. It is concluded that the systematic evaluation of GMP associated with the microbiological characterization of the production areas of the hospital kitchen are fundamental tool in the verification of biological hazards that are involved in each process within the UANH.

**Keywords:** patient, waterborne and foodborne diseases, surfaces, Hazard Analysis and Critical Control Points.

# Capítulo 1

## 1. INTRODUÇÃO

Com cerca de 600 milhões de casos de doenças de origem alimentar (DOA) anualmente, os alimentos não seguros são uma ameaça à saúde humana (FAO, 2022a). Dentro do contexto hospitalar, onde se espera que uma grande proporção de pacientes reaja mais severamente à ingestão de alimentos contaminados, é imprescindível que eles estejam seguros para o consumo, e que sejam armazenados, manuseados e processados em local que forneça condições para manter um elevado padrão de higiene.

Frente à necessidade de se estabelecer critérios de inspeção higiênico-sanitárias para os serviços de alimentação, a diretoria colegiada da Agência Nacional de Vigilância Sanitária (ANVISA) publicou em 2004 a Resolução nº. 216 (BRASIL, 2004), incluindo no âmbito da fiscalização, as unidades de alimentação e nutrição dos serviços de saúde (BRASIL, 2014). A nível estadual, o Centro de Vigilância de Saúde do estado de São Paulo, publicou em 2013, a Portaria CVS nº. 5, oferecendo um roteiro para a inspeção das Boas Práticas em estabelecimentos comerciais e serviços de alimentação (CVS, 2013).

A transferência de microrganismos aos pacientes via comida hospitalar pode ocorrer de maneiras diretas e indiretas. Bactérias patogênicas tais como *Listeria monocytogenes*, *Salmonella* sp. e *Bacillus cereus*, podem estar no alimento que, se não for bem cozido, como acontece com as frutas e alguns vegetais, podem ser transferidas dos alimentos aos pacientes (DOHTSU *et al*., 2001; AYÇIÇEK *et al*., 2004; AL-ABRI *et al*., 2011). Outra maneira pode ser através do funcionário portador de organismo patogênico, que pode manipular e contaminar os alimentos, transferindo-o assim ao paciente via suprimento alimentar (KHURANA *et al.,* 2008). Em terceiro lugar, o manuseio incorreto dos alimentos por meio de aquecimento, refrigeração ou armazenamento inadequado ou insuficiente pode resultar em DOA (GOHLAM-MOSTAFAEI *et al.*, 2017). Além dos alimentos, as bactérias que causam infecções nosocomiais podem vir de fontes como funcionários do hospital e equipamentos hospitalares, bem como das superfícies de contato direto e indireto com os alimentos (LUND *et al.,* 2009; COETZEE *et al*., 2011).

Quanto ao público-alvo, os critérios microbiológicos das legislações vigentes determinam padrões diferenciados para lactantes, crianças da primeira infância e pessoas sob nutrição enteral. Sendo assim, pressupõe-se que os demais padrões microbiológicos, a fim de atender os objetivos de formação, manutenção e desenvolvimento humano cabe aos indivíduos saudáveis (BRASIL,

2022b; BRASIL, 2022c). Para o departamento de fiscalização dos alimentos dos Estados Unidos, *Food and Drug Administration*, todas as crianças e os adultos que adquirem alimentos em estabelecimentos de saúde são classificados como população altamente susceptível às DOA (FDA, 2017).

Levanta-se, portanto, as seguintes questões: 1- O cumprimento da RDC nº. 216/2004, a qual estabelece as Boas Práticas de Fabricação de forma ampla para todos os serviços de alimentação, garante a inocuidade dos alimentos a serem ofertados a pacientes hospitalizados? 2- Os limites microbiológicos estipulados pela Instrução Normativa nº. 161/2022 são suficientes para suprimir ações biológicas e efeitos adversos para a saúde desta população? 3- Os elos dentro da cadeia de alimentos são capazes de se autocontrolar, ou seja, de identificar os perigos e tomar medidas preventivas quanto aos possíveis perigos existentes?

A Lei nº. 9.431/1997 impõe aos hospitais a obrigatoriedade de um Programa de Controle de Infecção Hospitalar; entendendo-se por infecção hospitalar, também denominada institucional ou nosocomial, qualquer infecção adquirida após a internação de um paciente em hospital e que se manifeste durante a internação ou mesmo após a alta, quando puder ser relacionada com a hospitalização (BRASIL, 1997). Ainda, a ANVISA, atendendo à Organização Mundial da Saúde (OMS), elaborou o Programa Nacional de Prevenção e Controle de Infecções Relacionadas à Assistência à Saúde (PNPCIRAS), que estipula metas para o controle das Infecções Associadas à Assistência à Saúde (IRAS) e a redução da resistência microbiana (RM) (BRASIL, 2021). Nestas e nas demais legislações vigentes relacionadas à alimentação, as Unidades de Alimentação e Nutrição Hospitalar (UANH) não são contempladas compulsoriamente como parte da investigação epidemiológica de surtos hospitalares (BRASIL, 1976; BRASIL,1998; BRASIL, 1990; BRASIL, 2004; BRASIL, 2020a; BRASIL, 2022a).

Sabendo-se que patógenos de origem alimentar podem agravar o quadro clínico de um paciente hospitalizado, recai à UANH a definição de critérios rigorosos de busca ativa de patógenos e de autoavaliação, capazes de eliminar, diminuir e prevenir os riscos biológicos dentro das cozinhas hospitalares, a fim de preparar alimentos dentro dos mais elevados graus de higiene para um público altamente vulnerável às DOA.

## 2. REVISÃO DE LITERATURA

Diversos surtos envolvendo alimento hospitalar foram descritos mundialmente (SHETTY *et al.*, 2009; COKES *et al.*, 2011; GAUL *et al.*, 2013; NAJJAR *et al.*, 2015; RUSSINI *et al.*, 2021). Nas últimas décadas, a epidemiologia das doenças veiculadas pelos alimentos está mudando com o surgimento de novos e inesperados patógenos muitas vezes emergindo em escala nacional ou mundial (BUCCHERI *et al.*, 2007).

Dentro do contexto hospitalar, onde se espera que uma grande proporção de pacientes reaja mais severamente à ingestão de alimentos contaminados, é especialmente importante que os alimentos adquiridos estejam “bacteriologicamente limpos" e que sejam armazenados, manuseados e processados em local que forneça condições para manter um elevado padrão de higiene (MCKILOP, 1959). Vários outros estudos apontam que a refeição hospitalar ofertada aos pacientes foi responsável por intoxicações, dores abdominais e diarreias. As causas vão desde falhas de higiene durante a manipulação, falhas em atingir a temperatura mínima de cocção no interior da matriz alimentar e contaminação das matérias primas (AL-ABRI *et al*., 2011, ALTEKRUSE.*et al*., 1996, REGAN *et al*., 1995, EVANS *et al*., 1996). Um surto alimentar em um hospital pode causar, portanto, elevada morbidade e mortalidade para os infectados, especialmente aos pacientes já vulneráveis (BANNA *et al.*, 2022).

A transferência de microrganismos aos pacientes via comida hospitalar pode ocorrer de três maneiras. Primeiro, a bactéria patogênica pode estar no alimento. Se o alimento não for bem cozido, como acontece com as frutas e alguns vegetais, a bactéria pode ser transferida do alimento ao paciente. Segundo, o pessoal responsável pelo serviço de alimentação pode ser portador de organismos patogênicos que podem contaminar os alimentos, e então, ser transferido ao paciente via suprimento alimentar. Terceiro, o manuseio incorreto dos alimentos por meio de aquecimento, refrigeração ou armazenamento inadequado ou insuficiente pode resultar em doenças transmitidas por alimentos. Além dos alimentos, as bactérias que causam infecções nosocomiais podem vir de fontes como funcionários do hospital (enfermeiras, médicos, etc.), equipamentos de hospitais gerais e vítimas de queimaduras (PASCH *et al*., 1974).

McKillop (1959) realizou um estudo epidemiológico de casos de intoxicação em pacientes que apresentaram diarreia após a internação hospitalar. Oitenta e nove alimentos cárneos crus e 38 alimentos prontos para o consumo adquiridos pelo hospital estavam contaminados concomitantemente com cepas hemolíticas e não-hemolíticas de *Clostridium welchii*,

*Stahphylococcus aureus*, *Salmonella* sp. e *Shigella* sp. Cento e setenta e três alimentos se mostraram positivos para os patógenos *Clostridium welchii*, *Stahphylococcus aureus* logo após o preparo.

Em setembro de 1973, 32 indivíduos de um hospital do Maine, Estados Unidos, tiveram diarreia relacionada com *Salmonella* Typhimurium. As investigações mostraram que a infecção foi provavelmente causada pelo consumo de ovos crus misturados com leite (egg-nog). No entanto, alguns pacientes e funcionários que não consumiram gemada continuaram a adoecer depois de a fonte ter sido removida. Foi determinado que a transmissão de *S.* Typhimurium de pessoa para pessoa ocorreu dentro do hospital, representando um risco tanto para os pacientes como para o pessoal (STEERE *et al*., 1975).

Uma análise de 50 surtos hospitalares de intoxicação alimentar na Escócia (1973-1977) envolveu mais de 1.530 pessoas que consumiram alimentos preparados no hospital. *Clostridium perfringens*, *Salmonella* sp. e *Staphylococcus aureus* foram identificados como os principais causadores. As unidades psiquiátricas e geriátricas foram responsáveis por muitos incidentes, tendo sido afetados 33 hospitais (SHARP *et al*., 1979).

Em 1989, um surto de intoxicação alimentar por *Salmonella* sp. foi registrado tendo origem a cafetaria de um Hospital Universitário. Um estudo caso-controle em 223 indivíduos revelou uma taxa de ataque de 19,6%, com sintomas que incluíam diarreia, febre, dor abdominal, desidratação e fezes com sangue. *Salmonella* Enteritidis grupo D foi encontrada em culturas de fezes de pacientes e funcionários e o alimento implicado foi purê de batata. Concluiu-se que a contaminação ocorreu pelas mãos do manipulador de alimentos (KHURI-BULOS *et al*., 1994).

Lacey e Buckingham (1993) relatam que no Reino Unido os hospitais utilizam o sistema "cook-and-chill". Amostras de alimentos coletados antes do reaquecimento demonstraram a presença de *Salmonella* sp. A falha foi decorrente de práticas pouco seguras na produção, reforçando a importância da vigilância quando se trata de servir refeições a doentes de alto risco.

Griffith *et al.* (2000) realizaram um levantamento bibliográfico de causa de infecções hospitalares relacionadas com superfícies contaminadas de cozinhas. Onze referências demonstraram a presença de *Salmonella* Typhimurium em utensílios da cozinha. Além disso, 8 referências relataram surtos de gastrenterite em hospitais infantis através de contaminação cruzada de superfície de cozinha para mãos e destas por sua vez para a boca.

Pinto *et al*. (2004) investigaram a presença de *Listeria monocytogenes*, *Salmonella* sp. e *Klebsiella* sp. em dietas enterais e ambientes de preparo de alimentos em serviços de alimentação hospitalar. *Salmonella* Rissen e *Listeria* monocytogenes foram encontradas em uma dieta enteral. *Klebsiella pneumoniae* foi encontrada em utensílios e equipamentos, enquanto *Klebsiella oxytoca* foi encontrada em ambiente, equipamento e dieta enteral. Avaliando-se a contaminação bacteriana em dieta enteral em um hospital pediátrico, Roy *et al.* (2005) identificaram 9 de 26 amostras contaminadas ($>10^2$ UFC/mL); destas 20% apresentaram contaminação significativa ($\geq 10^4$ UFC/ mL). A causa foi relacionada à contaminação cruzada no preparo do alimento na unidade dietética.

Os manipuladores de alimentos possuem, portanto, um papel fundamental na produção de alimentos seguros para o consumo. Ayçiçek *et al.* (2004) coletaram 180 amostras de mãos e luvas dos funcionários de uma cozinha hospitalar, antes e durante o preparo dos alimentos. Cinquenta e um de 60 (85%) luvas amostradas durante os trabalhos e 57 (95%) mãos amostradas antes dos trabalhos apresentaram resultados positivos. Foram isolados 16 tipos diferentes de bactérias, sendo as mais comuns *Staphylococcus aureus* (126/180; 70%), *Staphylococcus* coagulase-negativa (102/180; 56,7%), *Bacillus* spp. (19/180; 10,5%) e *Escherichia coli* (14/180; 7,8%). Um estudo realizado em Palermo, na Itália, avaliou o conhecimento, as atitudes e as práticas da equipe de enfermagem em relação à segurança alimentar. Os resultados revelaram uma falta de conhecimento sobre doenças transmitidas por alimentos, temperaturas de armazenamento inadequadas e práticas incorretas de manuseio (BUCCHERI *et al.,* 2007).

As DOA em ambientes de saúde podem, portanto, ter consequências graves, incluindo doenças, desperdício de tratamento, disseminação de infecções e interrupção de serviços. Garantir refeições seguras e nutritivas para indivíduos vulneráveis requer uma abordagem sistemática usando os princípios do HACCP (LUND & O'BRIEN, 2010). As evidências disponíveis em literatura demonstram a necessidade de vigilância permanente para a prevenção e manutenção de baixos níveis microbiológicos nas refeições.

No Brasil, a Lei nº. 9.431/1997 impõe aos hospitais a obrigatoriedade de um Programa de Controle de Infecção Hospitalar entendendo-se por infecção hospitalar, também denominada institucional ou nosocomial, qualquer infecção adquirida após a internação de um paciente em hospital e que se manifeste durante a internação ou mesmo após a alta, quando puder ser relacionada com a hospitalização (BRASIL, 1997). O âmbito da legislação, porém, não abrange as Unidades de Alimentação e Nutrição Hospitalar (UANH), que, embora sigam legislações específicas

para Boas Práticas de Manipulação, não são contempladas compulsoriamente como parte da investigação epidemiológica de surtos hospitalares (BRASIL, 1976; BRASIL, 1990; BRASIL, 1998; BRASIL, 2004; BRASIL, 2020b).

Sendo assim, o atendimento dos critérios das Boas Práticas de Fabricação contribui positivamente para a qualidade do alimento fornecido, reduzindo a possibilidade do envolvimento do alimento hospitalar como fonte de infecção. Entende-se por Boas Práticas de Fabricação *"normas de procedimentos para atingir um determinado padrão de identidade e qualidade de um produto e/ou de um serviço na área de alimentos, cuja eficácia e efetividade deve ser avaliada através da inspeção e/ou da investigação. Aqui incluem-se também produtos tais como: as bebidas, aditivos, embalagens, utensílios e materiais em contato com alimentos"* (BRASIL, 1993).

Desta forma, os seguintes elementos de inspeção devem compor um Manual de Boas Práticas de Fabricação: manutenção e higienização das edificações, instalações, equipamentos, móveis e utensílios, bem como do reservatório de água; controle integrado de vetores e pragas urbanas; potabilidade da água de abastecimento; manejo de resíduos; hábitos de higiene e saúde dos manipuladores; controle das matérias-primas, ingredientes e embalagens; controles no preparo dos alimentos; armazenamento, transporte e exposição ao consumo dos alimentos preparados; controle dos documentos e registros; responsáveis pelo programa (BRASIL, 2004).

À nível hospitalar, o Brasil dispõe de requisitos específicos de Boas Práticas de Fabricação apenas para a fabricação de fórmulas destinadas aos indivíduos portadores de erros inatos do metabolismo, uma doença rara de origem genética, causada por um defeito específico que leva ao bloqueio de determinada via metabólica (BRASIL, 2020b). Frente à vulnerabilidade do paciente à uma DOA, mesmo que os padrões de BPF estipulados pela ANVISA sejam atingidas na cozinha hospitalar, estudos mais detalhados são necessários para determinar se os níveis microbiológicos descritos na IN nº. 161/2022 são seguros o suficiente para não interferir na patologia primária destes indivíduos. Portanto, é fundamental que as ferramentas de garantia da inocuidade dos alimentos sejam rotineiramente avaliadas quanto à sua capacidade identificar, controlar, e reduzir ou eliminar os riscos à saúde dos pacientes.

Frente a gravidade das consequências da veiculação de um patógeno inesperado no ambiente hospitalar, recai aos manipuladores de alimentos das UANH a percepção da importância do seu papel na prevenção das enfermidades transmitidas e veiculadas pelos alimentos. Eles precisam garantir que a manipulação e o preparo dos alimentos prontos para o consumo seja executado

dentro do mais elevado grau de higiene, e também estar cientes que podem ser portadores e carreadores de patógenos alimentares como *Escherichia coli*, *Salmonella* sp. e *Staphylococcus aureus*, em particular em sua pele ou nariz (MARQUES, 2020).

Sendo assim, faz-se necessário avaliar a capacidade de uma UANH em identificar os perigos biológicos para reduzir as contagens bacterianas e garantir a inocuidade dos alimentos e para isso deve-se verificar a eficácia do plano de BPF. O presente trabalho buscou levantar o *status* sanitário de uma UANH utilizando-se como ferramenta o *checklist* de BPF da ANVISA em associação com análises microbiológicas das possíveis fontes de contaminação cruzada com os alimentos. Após a constatação e correção dos desvios, será realizado nova avaliação para verificar a efetividade das medidas tomadas e a inocuidade dos alimentos.

# Capítulo 2

TRABALHO CIENTÍFICO

Artigo a ser enviado para a revista *Journal of Hospital Infection*

(Normas de publicação da revista disponíveis no Anexo I).

# Microbiological assessment of a hospital kitchen before and after Good Manufacturing Practices intervention

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Keywords: Patients, Foodborne Disease, Surfaces, HACCP.

Running Title: GMP Improvement in Hospital Kitchen after Microbiological Assessment

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## Abstract

**Background** Unsafe food causes millions of cases of foodborne illness each year, being dangerous to hospitalized patients. Studies have shown that food poisoning in hospitals is mainly caused by improper hygiene and food handling. Effective implementation of Good Manufacturing Practices (GMP), including routine microbiological monitoring is essential to ensure high hygiene standards in the hospital kitchen.

**Objectives** To investigate the impact of good manufacturing practice (GMP) on the identification and prevention of bacteria that could pose a risk to patient meals.

**Methods** The study used two GMP checklists and microbiological sampling of bacteria, carried out six months apart, to assess the facility's ability to reduce bacterial counts.

**Results** The results showed hygiene failures in all areas of the hospital. However, there was a significant improvement in GMP compliance following the implementation of an action plan ($p=0.0234$). Pre-intervention, 55.55% (75/136) criteria were compliant, and after, 69.63% (94/136). Surfaces involved in raw material handling were identified as the most critical in terms of contamination, with high levels of aerobic mesophilic count (AMC), *Enterobacteriaceae* (EB) and the presence of virulent *Listeria monocytogenes* (LM). The intervention resulted in a significant reduction in the number of bacteria on these surfaces ($p<0.05$). Before, the AMC ranged from 2.61 to 4.69 and after, from 0.48 to 2.55 median log CFU/surface. Additional testing of incoming materials, food and hands showed no significant risk to meals.

**Conclusion** The study highlighted the importance of good hand hygiene, which improved following extensive staff training. The GMP guideline and microbiological characterisation of the production sites in the hospital kitchens were essential for understanding and acting on bacterial contamination in each area.

## Introduction

Unsafe food poses a significant threat to human health, with approximately 600 million cases of foodborne disease (FD) occurring annually [1]. Numerous outbreaks associated with hospital food have been reported worldwide [2–6]. The epidemiology of foodborne diseases is changing with the

46 emergence of new and unexpected pathogens on a national or global scale. Bacteria, such as
47 *Listeria monocytogenes*, can complicate the identification of sources of contamination due to their
48 widespread nature and variable incubation periods [7].

49 In the hospital setting, where patients are more susceptible to ingesting of contaminated food,
50 it is essential that the food purchased is bacteriologically clean and handled in a hygienic
51 environment [8]. Several studies have shown that hospital meals have caused poisoning, abdominal
52 pain and diarrhoea due to poor hygiene, failure to achieve minimum cooking temperatures and
53 contamination of raw materials [9–12]. Foodborne outbreaks in hospitals can cause high morbidity
54 and mortality, particularly in vulnerable patients [13]. Foodborne pathogens can reach patients
55 through contaminated food, food handlers, or improper food handling. Nosocomial bacteria can also
56 come from hospital staff, equipment, and burn patients [14].

57 McKillop (1959) conducted an epidemiological study of cases of food poisoning in hospitalised
58 patients with diarrhoea. Raw meat products and ready-to-eat foods purchased by the hospital were
59 contaminated with *Staphylococcus aureus* and *Salmonella* sp. After preparation, 173 foods tested
60 positive for *Staphylococcus aureus* and *Salmonella* sp. [8]. In 1973, a *Salmonella* outbreak in a
61 hospital in Maine was initially linked to contaminated eggnog, but human-to-human transmission
62 continued even after the source was removed, posing a risk to patients and staff [15]. A study of
63 foodborne outbreaks in hospitals in Scotland (1973-1977) identified 50 incidents involving over
64 1,530 people. *Clostridium perfringens*, *Salmonella* sp. and *Staphylococcus aureus* were the most
65 common pathogens, with psychiatric and geriatric wards frequently involved [16]. In 1989, a
66 *Salmonella* outbreak in a university hospital canteen affected 19.6% of the population. Contaminated
67 mashed potatoes were identified as the source, transmitted by the hands of food handlers [17].
68 *Salmonella* Typhimurium contamination of preheated food samples was found in the UK cook-and-

chill system in hospitals. Contamination of kitchen surfaces led to outbreaks of gastroenteritis in children's hospitals, highlighting the need for surveillance and hygiene practices [18]. Pinto *et al* (2004) discovered *Salmonella* sp. and *Listeria monocytogenes* in hospital enteral diets and food preparation areas [19]. Roy *et al* (2005) found bacterial contamination in paediatric hospital enteral feeds due to cross-contamination during food preparation [20].

The history of foodborne epidemiology in hospitals suggests that food handlers play a critical role in ensuring safe food production for consumption. Ayçiçek *et al* (2004) collected 180 samples from the hands and gloves of staff in a hospital kitchen before and during food preparation. 51 of 60 (85%) gloves sampled during work and 57 (95%) hands sampled before work tested positive. They isolated 16 different types of bacteria, the most common being *Staphylococcus aureus* (126/180; 70%), coagulase-negative *Staphylococcus* (102/180; 56.7%), *Bacillus* spp. (19/180; 10.5%) and *Escherichia coli* (14/180; 7.8%) [21].

Therefore, hospital kitchens must be vigilant in food preparation to prevent foodborne disease (FD), especially given the increased susceptibility of individuals purchasing food in healthcare facilities [22]. This requires careful standardisation of microbiological criteria for patient food and regular assessment to identify, control and minimise health risks. In Brazil, Law No. 9,431/1997 requires hospitals to have a hospital infection control programme. Hospital-acquired infections, also known as nosocomial infections, are defined as infections acquired after a patient's admission to hospital, manifesting during or after discharge, and associated with hospitalisation [23]. However, this legislation does not cover hospital food and nutrition units (UANH), which are subject to specific good practice regulations but are not mandatorily included in the epidemiological investigation of hospital outbreaks [24–29].

To ensure high standards of GMP, it is necessary to regularly evaluate the effectiveness of the programme and validate control measures. However, retail and food service operations present unique challenges due to the variety of meals and incoming raw materials [30]. This study aimed to evaluate the effectiveness of the GMP programme in a hospital kitchen using a checklist and microbiological sampling. The aim was to identify and control sources of bacteria that could compromise patient meals and to reduce the number of bacteria on kitchen surfaces through an action plan.

## Material and methods

### *Experimental design*

The study was conducted in a hospital kitchen serving two major hospitals and seven healthcare facilities in São Paulo state, Brazil. In the first round, the facility produced an average of 3650 meals per day, which increased to 6800 meals per day in the second round. Cross-contamination was assessed by sampling surfaces, raw materials, ready-to-eat food, water and hands. A checklist and microbiological samples were collected to develop an action plan to address deviations. Six months later, the checklist was repeated, and new samples were obtained to assess microbial improvements.

### *First Good Manufacturing Practices Checklist*

Compliance with 136 checklist questions was assessed according to the GMP criteria (Supplementary Data A) established by Resolution RDC nº 216/2004 and CVS nº 5/2013 of the State of São Paulo [31,32].

### *First microbiological assessment*

112 Swabs were taken from surfaces with and without food contact (Supplementary Table I). The
113 swabs were tested after the cleaning procedures and during the work shift for hygiene indicator
114 micro-organisms such as Aerobic Mesophilic Count (AMC) and *Enterobacteriaceae* (EB). In addition,
115 130 swabs were taken after the cleaning procedures and tested for *Listeria monocytogenes* (LM).
116 Food, beverage and water were collected according to Brazilian microbiological criteria and analysed
117 with international methods (Supplementary Table II). Hand swabs were taken before and after hand
118 washing, and during the work shift (Supplementary Data B). To classify hand washing as satisfactory,
119 Brazilian microbiological limits for antimicrobial soaps were used. The LM isolates went to molecular
120 characterization (Supplementary Table III).

121 *Action plan*

122 The findings were reported to the hospital's board of directors. An action plan was
123 implemented by the kitchen's quality assurance staff to address the deviations. After six months, the
124 checklist and microbiological samples were re-evaluated to determine the extent of microbial
125 improvement.

126 *Second Good Manufacturing Practices Checklist*

127 The effectiveness of the implementation of the action plan was assessed by monitoring the
128 teams' routines and reapplying the same checklist.

129 *Second microbiological assessment*

130 To verify the reduction in microbiological levels on surfaces, hands, water and food, all areas
131 previously sampled were re-tested using the same sampling criteria and analytical methods as
132 previously described.

*Statistical analysis*

Statistical analyses were performed using SAS 3.81 software. Qualitative results were presented as frequencies. Fisher Exact Test was used to compare pre- and post-intervention. Normality of the counting was assessed with Shapiro-Wilk test and considered non-parametric. Results were presented as median log CFU/sample. Kruskal-Wallis followed by Dunn´s test was used to verify differences in the median values pre and post-intervention and between areas.

## Results

*Good Manufacturing Practices compliances on the checklist*

Pre-intervention, 55.55% (75/136) criteria were compliant with GMP, and after, 69.63% (94/136), therefore an overall improvement was observed, but no statistical difference was found between the pre- and post-intervention results individually ($p>0.05$). Pest control and water supply showed no improvement (Figure 1).

*Micro-organisms counts on the surfaces*

By area, most median counts (log CFU/surface) of AMC and EB showed significant reductions ($p<0.05$) (Figure 2). The median counts of AMC at the butchery were 4.68 pre-intervention and went to 2.55 ($p=0.0002$) after, cold storage were 4.45 and went to 2.18 ($p=0.0374$), kitchen 4.00 to 0.90 ($p<0.0001$), distribution 2.61 to 1.40 ($p=0.2466$), snacks 3.32 to 0.48 ($p=<0.0001$), pre-preparation 4.69 to 2.02 ($p<0.0001$) and dessert 3.08 to 1.29 ($p=0.0074$). EB counts decreased significantly ($p<0.05$) in the kitchen, snacks and pre-preparation areas (Figure 3). The median counts of EB at the butchery were 1.43 pre-intervention and went to 1.06 ($p=0.3781$) after, cold storage were 1.99 and went to 1.00 ($p=0.4399$), kitchen 0.69 to 0.00 ($p=0.0212$), distribution 0.00 to 0.00 ($p=0.7984$),

154 snacks 0.15 to 0.00 (p=0.0043), pre-preparation 2.62 to 0.86 (p=0.0082) and dessert 0.00 to 0.00
155 (p=0.9278).

156 When comparing AMC pre- and post-intervention by surfaces with (FC) and without (WFC)
157 food contact (Figure 4), almost all were statistically different ($p<0.05$), as for EB, most of the results
158 were not statistically different ($p>0.05$). It is expected that FC surfaces will have lower counts when
159 compared to WFC surfaces. This difference was observed in the snack area, which showed a
160 significant difference in AMC counts before (p=0.0471) and after the action plan (p=0.0353). As for
161 the EB counts, the surfaces of the pre-preparation area showed a significant difference before
162 (p=0.0471) and after (p=0.0353).

163 When comparing AMC and EB pre- and post-intervention by sampling moment it was expected
164 lower counts after the cleaning procedures (AC) than during the working shift (DS). The data
165 showed no statistical difference in distribution and cold storage areas (Figure 4), regardless of the
166 moment, study round or the bacteria ($p>0.05$). With the exception of these areas, the AC and DS
167 samples for AMC pre- and post-intervention showed statistically significant reduction ($p<0.05$).
168 However, the same results were not shown for EB in which almost all samples were not statistically
169 significant ($p>0.05$).

170 When comparing AMC of the sampling moments by area, prior to the intervention, counts at
171 AC were higher at the kitchen and dessert area, and the number was reduced at DS. Post-
172 intervention, the kitchen showed a significant reduction both at AC and DS. This improvement can
173 also be seen in the pre-preparation area: before, the counts were high and after, a significant
174 reduction occurred at both periods ($p<0.05$). In the cold store, before, samples taken AC were lower
175 than DS, and after, the counts decreased DS. As for EB, the snacks showed a significant difference
176 before the intervention (p=0.0218).

*Detection of Listeria monocytogenes on the surfaces, foods, and its genetic characterization*

All positive surfaces regardless of the study round, came from the butchery, 25.00% (4/16) FC and 8.34% (1/12) WFC.

Pre-intervention, 2.30% (3/130) of surfaces and 10.71% (3/28) of food samples tested positive. Post-intervention positivity was 3.84% (5/130) on surfaces. The comparison pre- and post-intervention shows no statistical differences ($p>0.05$).

Associating the LM with AMC, after the action plan, the AMC were lower and LM was higher than before. Before the action plan, one cutting board (4.30 median log CFU/surface) was positive for LM, and no package (2.78) nor stainless-steel cart (6.36) presented the pathogen. After, two samples of cutting board (2.00), two samples of package (1.51) and one sample of stainless-steel cart (3.61) tested positive. Pre-intervention, one LM-positive sample of cutting board (n=15) presented 4.30 median log CFU /surface. Afterwards, two cutting boards showed the pathogen (2.00 median log CFU /surface). LM isolates were serotyped and analysed for virulence and biofilm formation genes (Supplementary Data C). Before the intervention, the strains from the butchery were serotyped 4b, chicken and celery 1/2a. After, the chicken cutting board retained serotype 4b, while other surfaces showed serotype 1/2a.

*Microbiological characteristics of the food samples*

No *Bacillus cereus* (BC) and *Salmonella* sp. (SS) were found in the food categories before or after the intervention. Pre-intervention, one sample of unsterilised celery, one chicken strip and one beef strip tested positive for LM. Yeasts and molds (YM) were found in ready-to-eat bread (0.30 log CFU /g) and coagulase-positive *Staphylococcus* (CPS) in a sample of fresh fish (1.36 log CFU /g).

198 Post-intervention, no LM was found, but one sample of minced meat exceeded the EC limit (6.09
199 log CFU/g). Other food categories complied with the normative standards (Supplementary Table IV).

200 *Water samples*

201 The water results were compared according to the Brazilian microbiological standards for
202 drinking water [31,32]. According to the normative, only one monthly sample out of weekly samples
203 may show a positive result for total coliforms. In the present study, before the intervention, three
204 presences were observed for both coliforms at 36 °C and coliforms at 45 °C in the four consecutive
205 weeks of sampling days (Supplementary Table IV).

206 The coliform at 36 °C media counts from the taps of the pre-preparation were 0.32 log NMP
207 /mL (n=3), dessert 3.04 log NMP /mL (n=1) and snacks area 1.01 log NMP /mL (n=3), this last one
208 also having counts for EC (3.04 log NMP /mL, n=1). The filter in the pre-preparation area, used for
209 storage by immersion of sliced vegetables, was also non-compliant for coliforms with two positives
210 in the four-week survey (median 2.00 log NMP /mL, n=2).

211 Post-intervention results showed that the filter from the dessert area used to make beverages
212 tested positive for coliforms (median 0.32 log NMP /mL, n=3). Taps from the Dessert and Butchery
213 areas repeatedly showed coliforms over the four weeks of sampling days (median of 1.01 log NMP
214 /mL, n=3, and 2.57 log NMP /mL, n=3, respectively). PS was found in the butchery's tap water (0.84
215 log CFU/mL), above the limits established in the Brazilian normative (absence/250 mL).

216 *Hand samples*

217 No AMC significant differences were found before and after the intervention ($p>0.05$). Before,
218 one kitchen worker's hand showed CPS before hand washing (0.90 log CFU/hand) and one pre-

preparation worker's hand showed CPS during food handling (0.60 log CFU/hand). The bacteria were not found after the action plan. No EC was found in either period (Supplementary Table IV). Initial results showed 3.13% (3/32) of hand's AMC counts above 3.69 log CFU/hand, thus, unsatisfactory, but after the action plan 98.45% of hands (32/43) showed satisfactory hygiene (<3.69 log CFU/hand).

## Discussion

Knowing that foodborne pathogens can worsen a hospitalised patient's clinical condition, hospital kitchens must ensure food safety by identifying and controlling food hazards. The study was designed to determine whether Good Manufacturing Practices can identify and prevent potential sources of bacteria that pose a risk to patient meals. To achieve this, we carried out two GMP checklists followed by microbiological sampling of potential sources of contamination six months apart to assess the facility's ability to reduce bacterial counts and ensure food safety. The high-throughput analysis identified the raw material handling areas as the most concerning in terms of attributes that could cause food contamination. All areas had visible cleaning deficiencies and operator hygiene failures, and microbiological analysis confirmed the findings. Therefore, the GMP guideline and microbiological characterisations were instrumental in understanding and addressing the bacterial contaminants in each area.

The food handler plays the most important role in implementing HACCP and complying with its requirements [33]. The lack of food safety knowledge among food handlers is a serious threat to food safety in service establishments [34]. Ayçiçek et al (2004) collected 180 hand samples from hospital kitchen workers before and during food preparation [21]. Of 60 samples, 57 (95%) hands sampled before the work shift tested positive for sixteen different types of bacteria. The most common were *Staphylococcus aureus* (70%), negative-coagulase *Staphylococcus* (56.7%), *Bacillus*

242 spp. (10.5%) and *Escherichia coli* (7.8%). In this study, although the hygiene classification of almost
243 90% of the hands was considered satisfactory, the decrease in AMC counts between the two times
244 of each sampling day was not significant.

245 Areas more likely to favour bacterial growth on surfaces and food contamination by cross-
246 contamination were the butchery and pre-preparation areas. Although lower in the second visit, all
247 areas in both periods had visible food residues immediately after cleaning, associated with high
248 AMC and EB counts, demonstrating shortcomings in this procedure and explaining the detection of
249 LM, a serotype associated with listeriosis outbreaks [35]. A lack of standardisation of surface
250 cleaning methods was observed before and after the intervention, even after staff training on the
251 procedure. Pieniz *et al* (2019) reported similar results to the present study on surfaces. Before the
252 intervention, the meat cutting board had an AMC of 4.64 log CFU/cm², the vegetable cutting board
253 4.08 log CFU/cm² and the refrigerator 4.14 log CFU/cm². Afterwards, the media counts were 4.11,
254 4.78 and 2.76 log CFU/cm² respectively. The authors considered cleaning counts of mesophilic
255 aerobic microorganisms above 20 CFU/cm² for surfaces and above 100 CFU/cm² for equipment to
256 be unsatisfactory. Scanning electron microscopy of a plastic cutting board used for meat handling
257 showed biofilm formation after daily cleaning, indicating that special attention should be given to
258 more efficient disinfection strategies [36].

259 Raw foods are a source of pathogens in the processing areas. This study found LM in celery
260 before the sanitization practice. Gaul *et al* (2013) reported an outbreak of LM originating from diced
261 celery. Therefore, Listeriosis risk should be considered in fresh food selections for
262 immunocompromised patients [4].

263 Thermal transformation of raw and pre-prepared materials was shown to significantly reduce
264 AMC, but these results reflect the microbiological quality of the foods sampled and tested

immediately after preparation. During both GMP checklist assessments, a lack of food temperature verification and a gap of more than 6 hours between food packaging and distribution was observed, and all equipment designed to maintain temperatures at safe levels failed to achieve ≥ 60°C during the first visit. To assess the quality of the meals during transport from the kitchens to the patients, Réglier-Poupet *et al* (2005) analysed the delays at each stage of the transport process and measured the temperature inside the food trolley and the meals. The internal temperature of the meals was below 10°C in 91.7% of cases [37]. It is essential to control time and temperature to ensure food quality and safety in hospitals.

The kitchen water source may contain microbial contamination and substances that interfere with the microbicidal activity of antiseptics and disinfectants [38] The microbiological levels of the water found in this study may also explain the high AMC and EB counts on the recently cleaned surfaces at both visits, as well as the low decrease in the AMC count in the post-intervention after hand washing. Puga *et al* (2018) linked the ability of *Listeria monocytogenes* to colonise pre-established *Pseudomonas* biofilms. This may partly explain why this microorganism can persist in food processing environments [39].

## Conclusion

In conclusion, the study emphasised the importance of implementing GMP and ensuring food safety in hospital kitchens, as this has been shown to reduce microbiological counts on surfaces. It highlighted areas of concern such as manipulation of raw materials and hygiene of food handlers, cleaning procedures. Establishing routine microbiological surveillance and monitoring HACCP requirements and critical control points are essential in this process. Addressing these issues will help prevent foodborne illness and protect the health of hospitalised patients.

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## Declaration of interests

The authors declare no conflict of interest.

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## Authors contribution

DCS: investigation, data curation, formal analysis, writing-original draft preparation; JGP: conceptualization, resources, supervision, writing- reviewing and editing; FSP: statistical reviewing and editing; JPO & EARS: molecular analysis, writing- reviewing and editing.

## Figures Legends

**Figure 1.** Compliance frequency of the GMP criteria in the hospital kitchen before and after the intervention. Light grey bars: pre-intervention. Dark grey bars: post-intervention.

**Figure 2.** Comparison pre- and post-intervention of hygiene indicator micro-organisms (median [Q1;Q3]) by type of surfaces in the areas. AMC: aerobic mesophilic count; EB: *Enterobacteriaceae* count; FC: surface with food contact; WFC: surface without food contact. Black bars: pre-intervention. Grey bars: post-intervention.

**Figure 3.** Comparison pre- and post-intervention of the results of hygiene indicator micro-organisms (median [Q1;Q3]) by sampling moment. AMC: aerobic mesophilic count; EB: *Enterobacteriaceae* count; AC: after cleaning; DS: during shift. Black bars means pre-intervention. Grey bars means post-intervention.

**Figure 4.** The AMC and EB (log CFU/ surface) by production area before (a) and after (b) the intervention in the hospital kitchen to assess the GMP improvement. Bars sharing the same superscript are not significantly different from each other ($p>0.05$). Asterisks: no significant reduction before and after the intervention ($p>0.05$). Numbers above bars: number of samples positive for LM by area.

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Figure 1

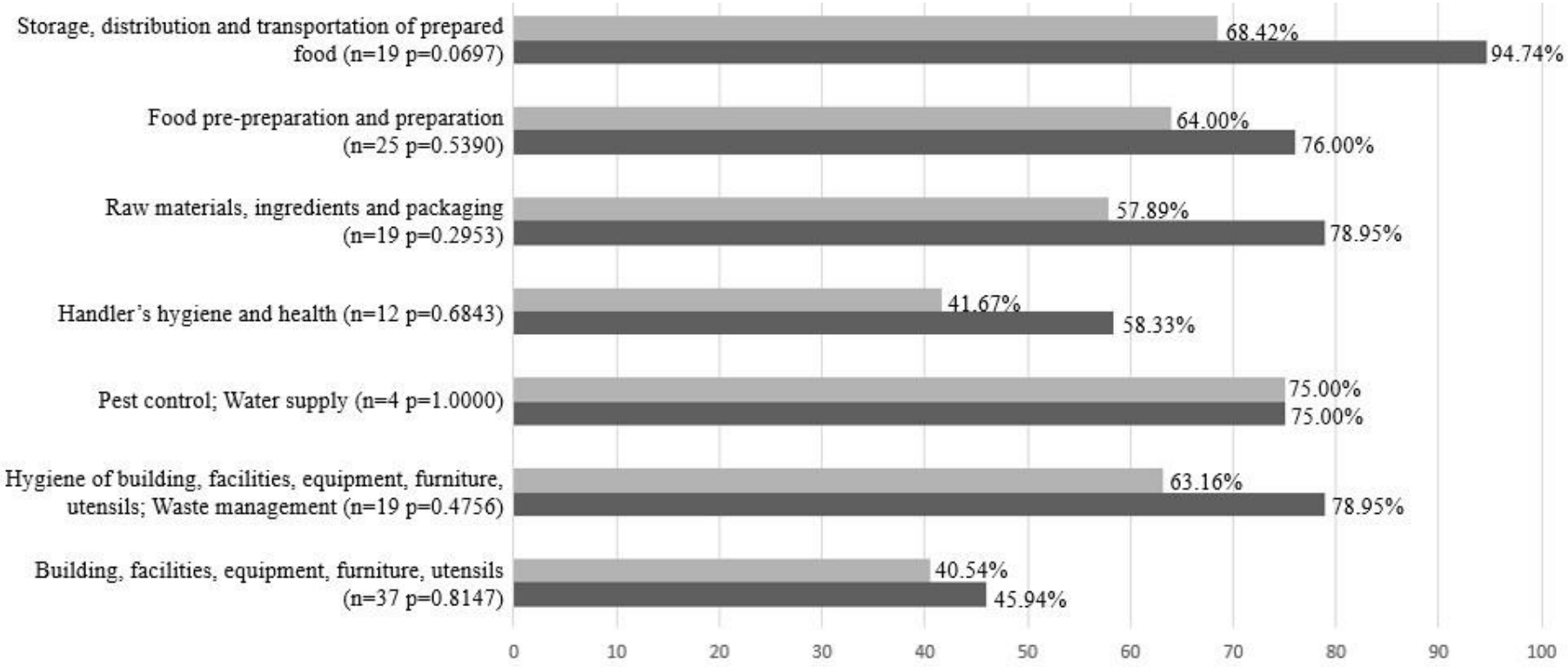

Storage, distribution and transportation of prepared food (n=19 p=0.0697)
68.42%
94.74%
Food pre-preparation and preparation (n=25 p=0.5390)
64.00%
76.00%
Raw materials, ingredients and packaging (n=19 p=0.2953)
57.89%
78.95%
Handler's hygiene and health (n=12 p=0.6843)
41.67%
58.33%
Pest control; Water supply (n=4 p=1.0000)
75.00%
75.00%
Hygiene of building, facilities, equipment, furniture, utensils; Waste management (n=19 p=0.4756)
63.16%
78.95%
Building, facilities, equipment, furniture, utensils (n=37 p=0.8147)
40.54%
45.94%
0
10
20
30
40
50
60
70
80
90
100

Figure 2

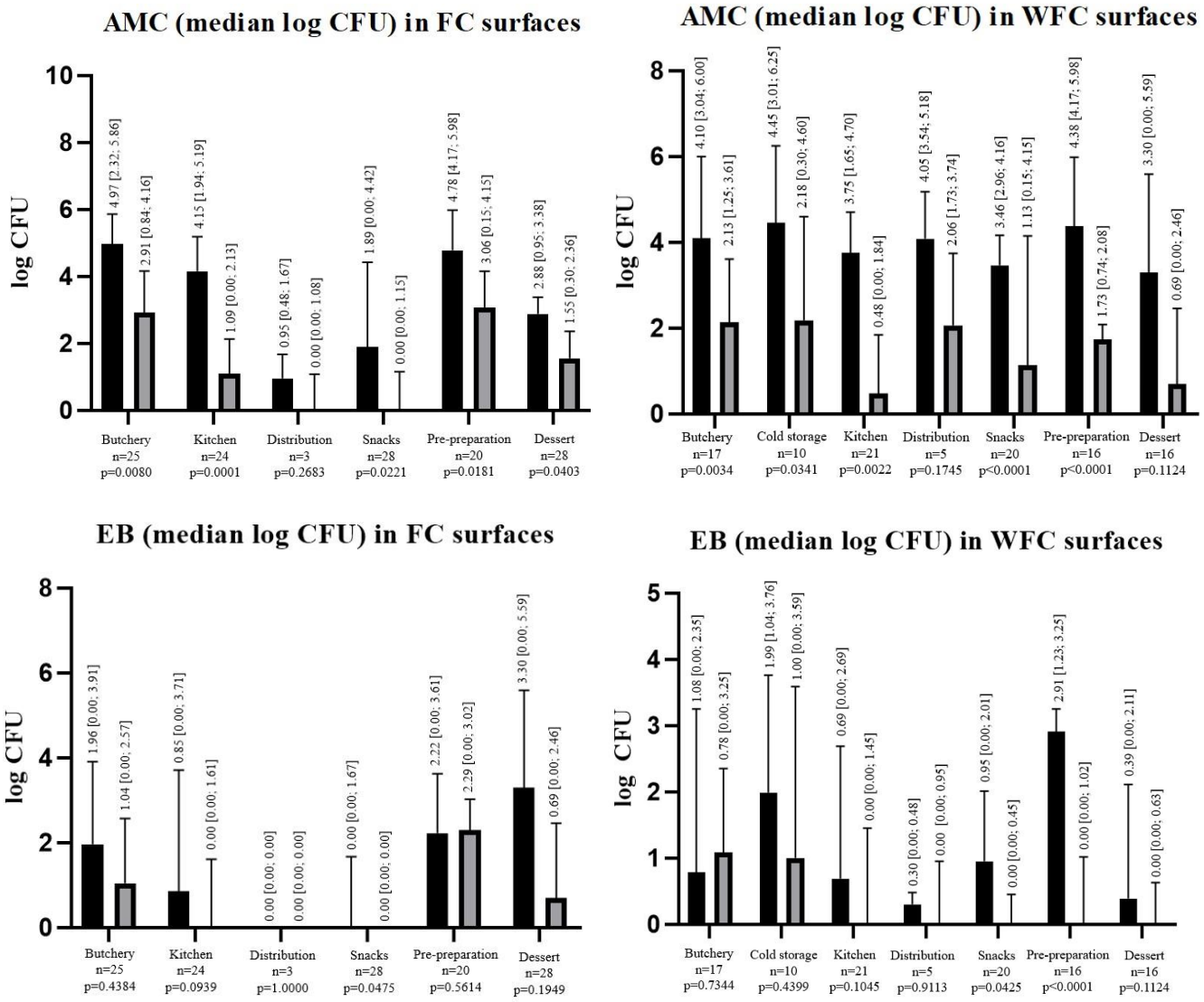

AMC (median log CFU) in FC surfaces
log CFU
4.97 [2.32; 5.86]
2.91 [0.84; 4.16]
4.15 [1.94; 5.19]
1.09 [0.00; 2.13]
0.95 [0.48; 1.67]
0.00 [0.00; 1.08]
1.89 [0.00; 4.42]
0.00 [0.00; 1.15]
4.78 [4.17; 5.98]
3.06 [0.15; 4.15]
2.88 [0.95; 3.38]
1.55 [0.30; 2.36]
Butchery n=25 p=0.0080
Kitchen n=24 p=0.0001
Distribution n=3 p=0.2683
Snacks n=28 p=0.0221
Pre-preparation n=20 p=0.0181
Dessert n=28 p=0.0403
AMC (median log CFU) in WFC surfaces
log CFU
4.10 [3.04; 6.00]
2.13 [1.25; 3.61]
4.45 [3.01; 6.25]
2.18 [0.30; 4.60]
3.75 [1.65; 4.70]
0.48 [0.00; 1.84]
4.05 [3.54; 5.18]
2.06 [1.73; 3.74]
3.46 [2.96; 4.16]
1.13 [0.15; 4.15]
4.38 [4.17; 5.98]
1.73 [0.74; 2.08]
3.30 [0.00; 5.59]
0.69 [0.00; 2.46]
Butchery n=17 p=0.0034
Cold storage n=10 p=0.0341
Kitchen n=21 p=0.0022
Distribution n=5 p=0.1745
Snacks n=20 p<0.0001
Pre-preparation n=16 p<0.0001
Dessert n=16 p=0.1124
EB (median log CFU) in FC surfaces
log CFU
1.96 [0.00; 3.91]
1.04 [0.00; 2.57]
0.85 [0.00; 3.71]
0.00 [0.00; 1.61]
0.00 [0.00; 0.00]
0.00 [0.00; 0.00]
0.00 [0.00; 1.67]
0.00 [0.00; 0.00]
2.22 [0.00; 3.61]
2.29 [0.00; 3.02]
3.30 [0.00; 5.59]
0.69 [0.00; 2.46]
Butchery n=25 p=0.4384
Kitchen n=24 p=0.0939
Distribution n=3 p=1.0000
Snacks n=28 p=0.0475
Pre-preparation n=20 p=0.5614
Dessert n=28 p=0.1949
EB (median log CFU) in WFC surfaces
log CFU
1.08 [0.00; 2.35]
0.78 [0.00; 3.25]
1.99 [1.04; 3.76]
1.00 [0.00; 3.59]
0.69 [0.00; 2.69]
0.00 [0.00; 1.45]
0.30 [0.00; 0.48]
0.00 [0.00; 0.95]
0.95 [0.00; 2.01]
0.00 [0.00; 0.45]
2.91 [1.23; 3.25]
0.00 [0.00; 1.02]
0.39 [0.00; 2.11]
0.00 [0.00; 0.63]
Butchery n=17 p=0.7344
Cold storage n=10 p=0.4399
Kitchen n=21 p=0.1045
Distribution n=5 p=0.9113
Snacks n=20 p=0.0425
Pre-preparation n=16 p<0.0001
Dessert n=16 p=0.1124

Figure 3

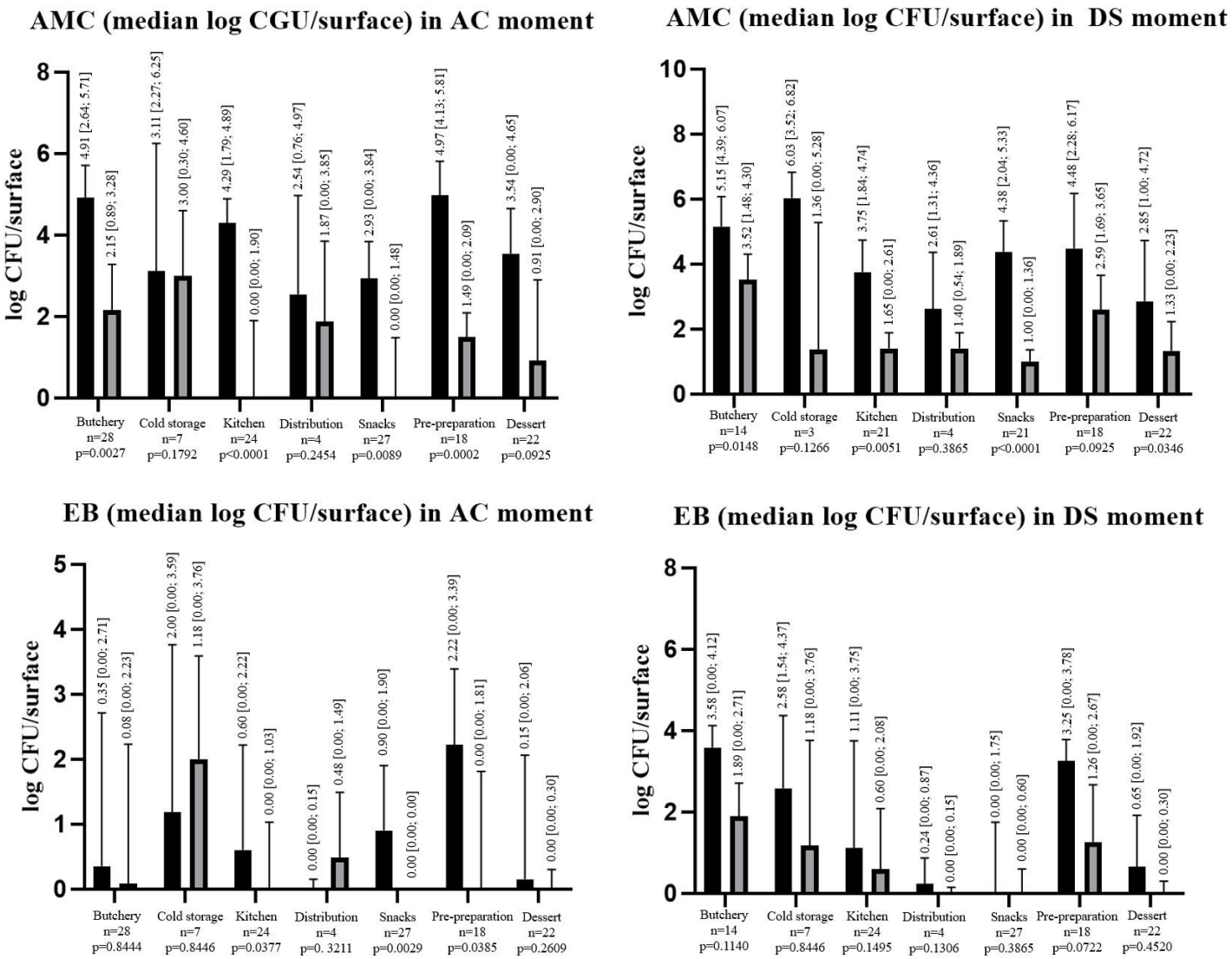
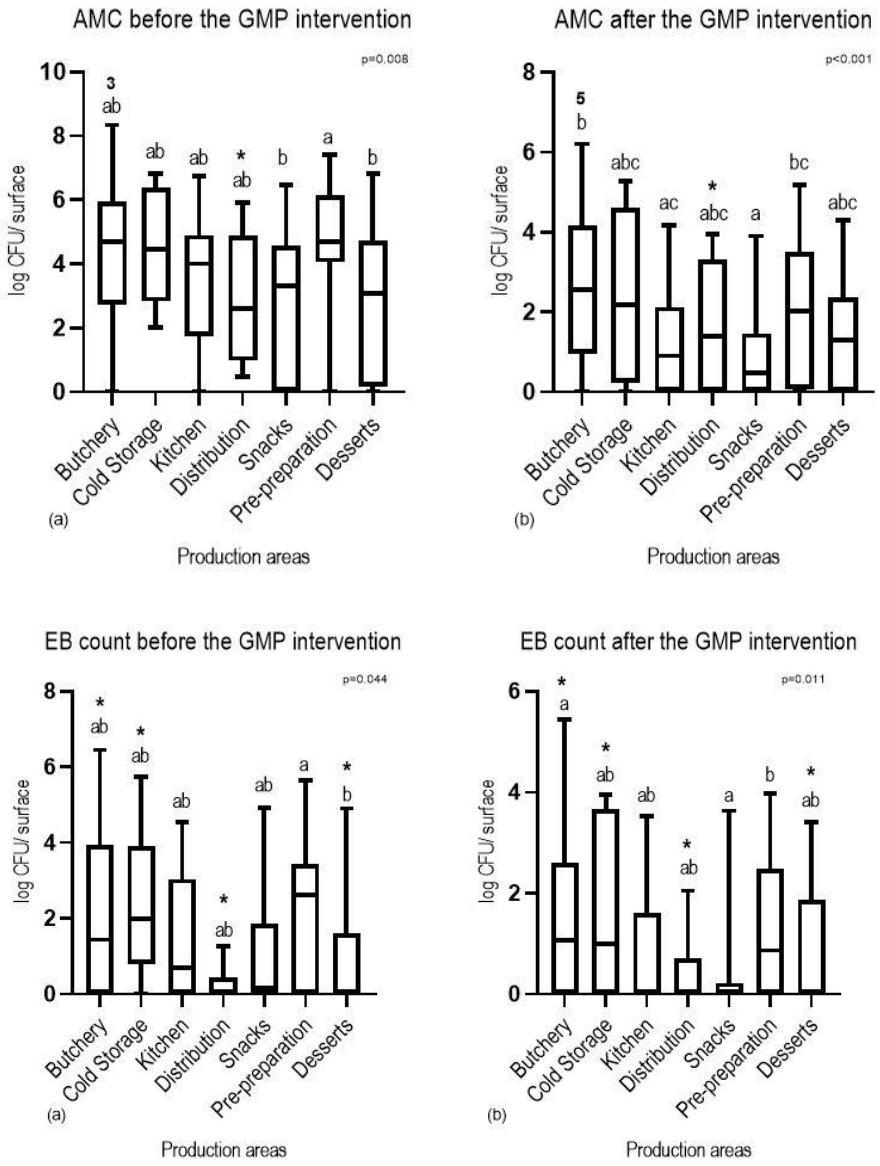

AMC (median log CGU/surface) in AC moment
log CFU/surface
4.91 [2.64; 5.71]
2.15 [0.89; 3.28]
3.11 [2.27; 6.25]
3.00 [0.30; 4.60]
4.29 [1.79; 4.89]
0.00 [0.00; 1.90]
2.54 [0.76; 4.97]
1.87 [0.00; 3.85]
2.93 [0.00; 3.84]
0.00 [0.00; 1.48]
4.97 [4.13; 5.81]
1.49 [0.00; 2.09]
3.54 [0.00; 4.65]
0.91 [0.00; 2.90]
Butchery n=28 p=0.0027
Cold storage n=7 p=0.1792
Kitchen n=24 p<0.0001
Distribution n=4 p=0.2454
Snacks n=27 p=0.0089
Pre-preparation n=18 p=0.0002
Dessert n=22 p=0.0925
AMC (median log CFU/surface) in DS moment
log CFU/surface
5.15 [4.39; 6.07]
3.52 [1.48; 4.30]
6.03 [3.52; 6.82]
1.36 [0.00; 5.28]
3.75 [1.84; 4.74]
1.65 [0.00; 2.61]
2.61 [1.31; 4.36]
1.40 [0.54; 1.89]
4.38 [2.04; 5.33]
1.00 [0.00; 1.36]
4.48 [2.28; 6.17]
2.59 [1.69; 3.65]
2.85 [1.00; 4.72]
1.33 [0.00; 2.23]
Butchery n=14 p=0.0148
Cold storage n=3 p=0.1266
Kitchen n=21 p=0.0051
Distribution n=4 p=0.3865
Snacks n=21 p<0.0001
Pre-preparation n=18 p=0.0925
Dessert n=22 p=0.0346
EB (median log CFU/surface) in AC moment
log CFU/surface
0.35 [0.00; 2.71]
0.08 [0.00; 2.23]
2.00 [0.00; 3.59]
1.18 [0.00; 3.76]
0.60 [0.00; 2.22]
0.00 [0.00; 1.03]
0.00 [0.00; 0.15]
0.48 [0.00; 1.49]
0.90 [0.00; 1.90]
0.00 [0.00; 0.00]
2.22 [0.00; 3.39]
0.00 [0.00; 1.81]
0.15 [0.00; 2.06]
0.00 [0.00; 0.30]
Butchery n=28 p=0.8444
Cold storage n=7 p=0.8446
Kitchen n=24 p=0.0377
Distribution n=4 p=0. 3211
Snacks n=27 p=0.0029
Pre-preparation n=18 p=0.0385
Dessert n=22 p=0.2609
EB (median log CFU/surface) in DS moment
log CFU/surface
3.58 [0.00; 4.12]
1.89 [0.00; 2.71]
2.58 [1.54; 4.37]
1.18 [0.00; 3.76]
1.11 [0.00; 3.75]
0.60 [0.00; 2.08]
0.24 [0.00; 0.87]
0.00 [0.00; 0.15]
0.00 [0.00; 1.75]
0.00 [0.00; 0.60]
3.25 [0.00; 3.78]
1.26 [0.00; 2.67]
0.65 [0.00; 1.92]
0.00 [0.00; 0.30]
Butchery n=14 p=0.1140
Cold storage n=7 p=0.8446
Kitchen n=24 p=0.1495
Distribution n=4 p=0.1306
Snacks n=27 p=0.3865
Pre-preparation n=18 p=0.0722
Dessert n=22 p=0.4520

Figure 4


AMC before the GMP intervention
p=0.008
log CFU/ surface
Butchery
Cold Storage
Kitchen
Distribution
Snacks
Pre-preparation
Desserts
(a)
Production areas
AMC after the GMP intervention
p<0.001
(b)
Production areas
EB count before the GMP intervention
p=0.044
(a)
Production areas
EB count after the GMP intervention
p=0.011
(b)
Production areas

# Capítulo 3

## DISCUSSÃO GERAL

Um número crescente de estudos demonstra que os ambientes de processamento e distribuição dos alimentos, e todas as atividades atreladas a estes locais, podem ser fonte de perigo biológico (PIENIZ *et al*., 2019; RANJBAR *et al*., 2019; COSTA *et al.*, 2015; NAJJAR *et al*., 2015; KONECKA-MATYJEK *et al.*, 2013; COKES *et al*., 2011; LUND *et al.*, 2009; SHETTY *et al*., 2009; KHURANA *et al*., 2008). Os sistemas tradicionais de avaliação da segurança dos alimentos se embasam na Análise de Perigos e Pontos Críticos de Controle (APPCC) para identificar pontos de provável ocorrência do perigo, levantando medidas de controle para a sua prevenção.

Indicadores microbiológicos possibilitam a verificação dos seus níveis de forma a se estabelecer ações quando as contagens ultrapassarem um limite superior aceitável preestabelecido. Da mesma forma, parâmetros específicos inerentes ao processo de fabricação, como por exemplo, mensuração de temperaturas, permitem o controle dos patógenos alimentares. Contudo, o sucesso do plano APPCC se dá no atendimento dos programas chamados de "programa de pré-requisitos" (PPR) dos quais fazem parte as Boas Práticas de Fabricação (BPF), Procedimento Padrão de Higiene Operacional (PPHO), Procedimento Sanitário Operacional (PSO), Procedimento Operacional Padrão (POP), rastreabilidade e outros programas de qualidade desenhados para atender à segurança dos consumidores finais.

Investigações relacionadas aos surtos envolvendo o consumo de alimentos contaminados descreveram que os estabelecimentos, embora possuíssem um plano APPCC robusto, apresentaram falhas e problemas relacionados aos pré-requisitos, em especial, higienização e hábitos de higiene dos manipuladores (HARARI *et al*., 2021; QUARANTA *et al.*, TEFFO *et al.*, 2015; TAN *et al*., 2020; WALLIS 2016; MENTZIOU *et al*., 2015; GHOLAM-MOSTAFAEI *et al*., 2017; AL-ABRI *et al*., 2011; SCHMID *et al.*, 2011; COETZEE *et al*., 2011; WINTER *et al*., 2009; LUND *et al*., 2009; SPOLAORE *et al.*, 2003). Nestes estudos, a rastreabilidade até a origem do alimento causador da DOA e da origem dos desvios no processamento só foi possível graças aos registros de monitoramento dos programas de gestão da qualidade.

Investigações epidemiológicas de casos de intoxicações alimentares em pacientes hospitalizados relacionaram a carga microbiológica inicial das matérias-primas antes do seu processamento como a causa de surtos (SCHMID *et al*., 2011; MELDRUM *et al*., 2007; RÉGLIER-POUPET *et al*., 2005; DOHTSU *et al.*, 2001) Sendo assim, em uma cozinha hospitalar, O

atendimento dos PPR associados às análises microbiológicas ambientais e dos alimentos são fundamentais para impedir a entrada destes patógenos.

O *checklist* evidenciou que falhas estruturais e no design dos equipamentos levam a necessidade de contrafluxos e contaminações cruzadas. Contudo, ficou claro que contrafluxos também ocorreram por falhas operacionais, demonstrando a importância da conscientização dos funcionários sobre os riscos biológicos desde as etapas de recebimento até a distribuição das refeições.

Falhas na higienização pré-operacional e operacional foram responsáveis por contagens microbiológicas altas nos ambientes frente à evidência de resíduos de alimentos em superfícies de contato e não-contato com os alimentos e os achados microbiológicos compatíveis com o *checklist*. O estudo demonstra que garantir a efetividade da higienização, através da verificação visual e tomada de ação corretiva imediata perante um desvio, é capaz de contribuir para a redução dos níveis microbiológicos, reduzindo assim o risco do carreamento dos microrganismos das superfícies para materiais e alimentos manipulados nestas superfícies.

A potabilidade da água é um fator que merece grande atenção pois pode levar ao risco de contaminação cruzada direta e indireta dos alimentos e superfícies. É imprescindível a associação das análises microbiológicas com análises físico-químicas como cloro residual livre, pH e matéria orgânica, para se estabelecer a causa dos desvios e tomar medidas preventivas quando se evidenciar desgaste da rede hidráulica, que podem levar a saturação do elemento filtrante antes da data programada da troca.

Quanto à higiene das mãos dos manipuladores, é necessário um esforço contínuo para a conscientização dos perigos, tanto para os manipuladores de alimentos, quanto para os auxiliares, terceiros e equipe técnico-administrativa.

Desvios com elevado grau de urgência nas tratativas foram levantadas: presença disseminada de *Listeria monocytogenes* no setor de açougue, falha na manutenção da temperatura dos alimentos quentes, falha no monitoramento do PCC, e uso de ingrediente possivelmente contaminado com *Salmonella* sp. Observou-se que após a aplicação do plano de ação, as não-conformidades foram sanadas. A urgência na resolução dos desvios, que afetam diretamente a segurança dos alimentos, demonstra o comprometimento da alta direção com a saúde pública. Mesmo assim, funcionários negligenciam a etapa de monitoramento da temperatura, entendendo-se que esforços ainda são

necessários para manter os perigos biológicos sob controle. Mesmo que houve a redução da carga microbiana quando comparados os resultados microbiológicos das matérias-primas e destas após a cocção, não há etapas subsequentes no processo que eliminem os riscos microbiológicos. É, portanto, fundamental que o monitoramento das temperaturas seja realizado rigorosamente.

## CONCLUSÃO GERAL

O estudo demonstra que o atendimento das Boas Práticas de Fabricação é capaz de identificar desvios que podem levar às contaminações diretas e indireta sobre os alimentos hospitalares, e as ações tomadas na tentativa de melhorar os índices microbiológicos foram capazes de reduzir as contagens. A excelência no atendimento ao programa se dá na percepção dos riscos e no esforço contínuo para a sua eliminação por todos os envolvidos.

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## ANEXO I

Normas de publicação para a revista *Journal of Hospital Infection*, disponível em:

https://www.journalofhospitalinfection.com/content/authorinfo#original

**ANEXO II -** Supplementary Data A – Good Manufacturing Practices *Checklist* and facility layout.

| | |
|---|---|
| | **Public Food Guidance Services/FMVZ/UNESP** |
| | FOOD INSPECTION LABORATORY |
| | Rua Prof. Dr. Walter Mauricio Correa, s/n Bairro: Unesp - Botucatu/SP CEP:18618-681 Fone: +55 14 3880-2110 |
| | GOOD MANUFACTURING PRACTICES IN HOSPITAL KITCHEN |

| | |
|---|---|
| **Inspector:** | |
| **Place:** | |
| **Date:** | |

| *CHECKLIST* A – BUILDING, FACILITIES, EQUIPMENT, FURNITURE, AND UTENSILS | | | | |
|---|---|---|---|---|
| **#** | **REGULATION** | **CRITERIA OF THE REGULATION** | **C / NC** | **NOTES:** |
| 1 | Resolution 216/2004 ANVISA - 4.1.1 | The building and facilities must be designed in such a way as to allow for an orderly flow without crossings at all stages of food preparation. | | |
| 2 | Resolution 216/2004 ANVISA - 4.1.1 | The building and facilities must be designed to facilitate maintenance, cleaning and, appropriate disinfection operations. | | |
| 3 | Resolution 216/2004 ANVISA - 4.1.1 | Access to facilities must be controlled and independent, not common to other uses. | | |
| 4 | CVS-5/2013 - Art. 77 | Direct and independent access, not common to housing and other uses. It must be designed in such a way as to restrict the movement of people who are not essential to production and ensure accessibility for people with disabilities or reduced mobility. | | |
| 5 | Resolution 216/2004 ANVISA - 4.1.2 | The dimensioning of the building and facilities must be compatible with all operations. | | |
| 6 | Resolution 216/2004 ANVISA - 4.1.2<br><br>CVS-5/2013 - Art. 78 | There must be separation between the different activities by physical means or by other effective means in order to facilitate cleaning and maintenance procedures, through continuous flows, without crossing stages and lines of the production process. If there are no separate areas for the various activities, there should be specific places for pre-preparation and food preparation. If the physical area does not allow this separation, all pre-preparation operations must be carried out initially, followed by the cleaning of equipment, utensils, containers, countertops, surfaces, sinks, floor and any contaminated place. Final food preparation operations must be carried out at a different time than pre-preparation in a sanitized environment. | | |
| 7 | CVS-5/2013 - Art. 78 | The return of dirty utensils must not pose a risk of contamination to clean utensils. | | |
| 8 | Resolution 216/2004 ANVISA - 4.1.3 | The physical installations such as the floor, wall and ceiling must have a smooth, waterproof and washable coating. They must be kept intact, preserved, free of cracks, cracks, leaks, leaks, infiltrations, mold, peeling, among others, and must not transmit contaminants to food. | | |
| 9 | Resolution 216/2004 ANVISA - 4.1.4 | Doors and windows must be kept tight to the stops. | | |
| 10 | Resolution 216/2004 ANVISA - 4.1.4 | Doors in the food preparation and storage area must be equipped with automatic closing. | | |
| 11 | Resolution 216/2004 ANVISA - 4.1.4 | External openings in food storage and preparation areas, including the exhaust system, must be provided with millimeter screens to prevent access by vectors and urban pests. Screens must be removable to facilitate periodic cleaning. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 12 | Resolution 216/2004 ANVISA - 4.1.5 | The facilities must be supplied with running water and have connections to a sewage system or septic tank. | | |
| 13 | CVS-5/2013 - Art. 71 | The sewage system must be connected to the public collection network and when an alternative system is used, the sewage must be properly treated and its destination must be approved by the competent environmental authority. | | |
| 14 | Resolution 216/2004 ANVISA - 4.1.5 | When present, the drains must be siphoned and the grids must have a device that allows them to be closed. | | |
| 15 | Resolution 216/2004 ANVISA - 4.1.6 | The grease and sewage traps must have a size compatible with the volume of waste, must be located outside the food preparation and storage area and must be in an adequate state of conservation and functioning. | | |
| 16 | CVS-5/2013 - Art. 72 | The water effluents drained to the sinks in the production area must pass through a grease trap installed outside the handling and storage area, and it must be cleaned periodically. | | |
| 17 | Resolution 216/2004 ANVISA - 4.1.7 | The internal and external areas of the establishment must be free of objects that are not in use or foreign to the environment, and the presence of animals is not allowed. | | |
| 18 | CVS-5/2013 - Art. 77 | External area must be free of unhealthy spots, such as garbage, objects in disuse, animals, dust, stagnant water, and vectors and urban pests. | | |
| 19 | Resolution 216/2004 ANVISA - 4.1.8 | The lighting in the preparation area must provide visualization so that activities can be carried out without compromising the hygiene and sensory characteristics of the food. | | |
| 20 | Resolution 216/2004 ANVISA - 4.1.8 | The lighting located over the food preparation area must be appropriate and be protected against explosion and accidental falls. | | |
| 21 | Resolution 216/2004 ANVISA - 4.1.9 | The electrical installations must be embedded or protected in external and intact pipes in such a way as to allow the cleaning of the environments. | | |
| 22 | Resolution 216/204 ANVISA - 4.1.10 | Ventilation must ensure air renewal and maintenance of the environment free of fungi, gases, smoke, dust, suspended particles, condensation of vapors, among others that may compromise the hygienic-sanitary quality of the food. | | |
| 23 | Resolution 216/204 - 4.1.10 | The air flow must not fall directly on the food. | | |
| 24 | Resolution 216/204 ANVISA - 4.1.11 | Air conditioning equipment and filters must be in good condition. The cleaning of the components of the air conditioning system, the exchange of filters and the scheduled and periodic maintenance of this equipment must be registered and carried out in accordance with specific legislation. | | |
| 25 | Resolution 216/204 ANVISA - 4.1.12 | Sanitary facilities and changing rooms must not communicate directly with the food preparation and storage area or cafeterias. | | |
| 26 | Resolution 216/204 ANVISA - 4.1.12 | Sanitary facilities and changing rooms must be kept organized and in an adequate state of conservation. | | |
| 27 | Resolution 216/204 ANVISA - 4.1.12 | Sanitary facilities and changing rooms must have external doors equipped with automatic closing. | | |
| 28 | Resolution 216/204 ANVISA - 4.1.13 | Sanitary facilities must have washbasins and be supplied with products intended for personal hygiene such as toilet paper, antiseptic odorless liquid soap or odorless liquid soap and antiseptic product and non-recycled paper towels or another hygienic and safe system for drying hands. Waste collectors must be equipped with a lid and activated without manual contact. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 29 | Resolution 216/204 ANVISA -4.1.14 CVS-5/2013 - Art. 80 | There must be exclusive sinks for hand hygiene in the handling area. | | |
| 30 | Resolution 216/204 ANVISA 4.1.14 CVS-5/2013 - Art. 80 | There must be washbasins in strategic positions in relation to the flow of food preparation and in sufficient number to serve the entire preparation area. | | |
| 31 | Resolution 216/204 ANVISA 4.1.14 CVS-5/2013 - Art. 80 | Washbasins must have antiseptic odorless liquid soap or odorless liquid soap and antiseptic product, non-recycled paper towels or another hygienic and safe hand drying system and paper collector, operated without manual contact. | | |
| 32 | CVS-5/2013 - Art. 81 | The cleaning of cleaning material, such as buckets, brooms, floor cloths, among others, must take place in an exclusive place outside the food preparation area. | | |
| 33 | CVS-5/2013 - Art. 79 | The sizing of equipment, utensils and furniture must be directly related to the production volume, the types of products or the menu pattern and the distribution and sales system. | | |
| 34 | CVS-5/2013 - Art. 79 | Renovations must be carried out outside of food handling hours. | | |
| 35 | Resolution 216/204 ANVISA - 4.1.15 | Equipment, furniture and utensils that come into contact with food must be made of materials that do not transmit toxic substances, odors or flavors to them, as established in specific legislation. | | |
| 36 | Resolution 216/204 ANVISA - 4.1.15 | Equipment, furniture and utensils must be kept in an adequate state of conservation and be resistant to corrosion and repeated cleaning and disinfection operations. | | |
| 37 | Resolution 216/204 ANVISA - 4.1.16 | Scheduled and periodic maintenance of equipment and utensils and calibration of measuring instruments or equipment must be carried out, keeping a record of the performance of these operations. | | |
| 38 | Resolution 216/204 ANVISA - 4.1.17 | The surfaces of equipment, furniture and utensils used in the preparation, packaging, storage, transport, distribution and display for sale of food must be smooth, impermeable, washable and free of roughness, crevices and other imperfections that could compromise their hygiene and are sources of food contamination. | | |
| 39 | CVS-5/2013 - Art. 33 | Refrigeration equipment and freezers must be in good condition and hygienicand adequate for the volume of product stored. It is forbidden to turn them off in order to save energy and to use glass rod thermometers to control their temperatures. | | |
| 40 | CVS-5/2013 - Art. 75 | The area for storing liquefied petroleum gas cylinders must be installed in a ventilated place, protected from the passage or entry of strangers and comply with the provisions of specific legislation. | | |
| *CHECKLIST* B – HYGIENE OF FACILITIES, EQUIPMENT, FURNITURE, AND UTENSILS; RESIDUE MANAGEMENT | | | | |
| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
| 1 | Resolution 216/2004 - 4.2.1 CVS-5/2013 - Art. 62 | The installations, equipment, or furniture and utensils must be kept in proper hygienic-sanitary conditions and in good condition. | | |
| 2 | Resolution 216/2004 - 4.2.1 CVS-5/2013 - Art. 62 | Hygienization operations must be carried out by demonstrably trained employees and with a frequency that guarantees the maintenance of these conditions and minimizes the risk of contamination of the food. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 3 | CVS-5/2013 - Art. 62 | Mandatory steps in the cleaning procedure: removal of dirt; washing with water and soap or detergent; rinse; chemical disinfection followed by a final rinse, or physical disinfection using steam. | | |
| 4 | CVS-5/2013 - Art. 62 | Cleaning of equipment and utensils should preferably take place in a dedicated area. | | |
| 5 | CVS-5/2013 - Art. 62 | The procedures and frequency of cleaning must be established in Standard Operating Procedures. | | |
| 6 | Resolution 216/2004 ANVISA - 4.2.6 | The utensils and equipment used in cleaning must be suitable for the activity and be kept, clean and available in sufficient numbers and stored in a place reserved for this purpose. | | |
| 7 | Resolution 216/2004 ANVISA - 4.2.6 | Utensils used to clean facilities must be different from those used to clean parts of equipment and utensils that come into contact with food. | | |
| 8 | Resolution 216/204 ANVISA - 4.2.5 CVS-5/2013 - Art. 62 | If the cleaning method is chemical, using cleaning and disinfection products registered with ANVISA, the method, the frequency of use, the active ingredients and the concentration of the cleaning and disinfection solutions used, and the temperatures and the contact times of the disinfectant solutions with the surfaces being cleaned. The products used must not leave residues or odors that could contaminate food. | | |
| 9 | CVS-5/2013 - Art. 62 | If the disinfection method uses steam, the method, the frequency of use, the temperature and the time of contact between the steam and the surfaces to be cleaned must be described. | | |
| 10 | CVS-5/2013 - Art. 63 | It is prohibited: I - dry sweeping and washing cleaning cloths in the handling area; II - make use of non-disposable cloths to dry utensils and equipment; III - reuse containers of food products to fill cleaning products; IV - domestic animals in the workplace; V - drain the residual water from environmental sanitation to the public road. | | |
| 11 | CVS-5/2013 - Art. 64 Resolution 216/2004 - 4.2.5 | It is prohibited: I - dry sweeping and washing cleaning cloths in the handling area; II - make use of non-disposable cloths to dry utensils and equipment; III - reuse containers of food products to fill cleaning products; IV - domestic animals in the workplace; V - drain the residual water from environmental sanitation to the public road. | | |
| 12 | Resolution 216/2004 ANVISA - 4.2.5 CVS-5/2013 - Art. 64 | The products used in the cleaning and disinfection procedures must be notified/registered with ANVISA, have all the mandatory labeling words for sanitizing products, established by federal legislation, and among them inform: I - complete data on the manufacturing company: name, address, telephone number, CNPJ and ANVISA's Operating Authorization Number; II - the name of the Technical Responsible and the registration number in his Professional Council; III - information on precautions and care in case of accident. | | |
| 13 | CVS-5/2013 - Art. 65 | Hygienization operations must be carried out by trained employees. When applying strongly alkaline cleaning and disinfecting products (eg. products for cleaning ovens and descaling grease), strongly acids, or strong oxidants (eg sodium hypochlorite and derivatives), handlers must wear high-top nitrile gloves, glasses and rubber boots. The instructions for use and safety recommended by the manufacturer of the products must be obeyed. | | |
| 14 | Resolution 216/2004 - 4.2.2 | Grease traps must be periodically cleaned. | | |
| 15 | Resolution 216/2004 ANVISA - 4.2.3 | Cleaning operations and, if applicable, disinfection of facilities and equipment, when not carried out routinely, must be recorded. | | |
| 16 | Resolution 216/2004 ANVISA - 4.2.4 | The food preparation area must be cleaned as many times as necessary and immediately after finishing work. Precautions should be taken to prevent food contamination caused by sanitizing products, particulate matter and aerosol formation. Odorizing and/or deodorizing substances in any of their forms must not be used in food preparation and storage areas. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 17 | Resolution 216/2004 ANVISA - 4.2.7 | Os funcionários responsáveis pela atividade de higienização das instalações sanitárias devem utilizar uniformes apropriados e diferenciados daqueles utilizados na manipulação de alimentos. | | |
| 18 | Resolution 216/2004 ANVISA - 4.5.1 | O estabelecimento deve dispor de recipientes identificados e íntegros, de fácil higienização e transporte, em número e capacidade suficientes para conter os resíduos. | | |
| 19 | Resolution 216/2004 ANVISA - 4.5.2 Portaria CVS-5/2013 - Art. 73 | Os coletores utilizados para deposição dos resíduos das áreas de preparação e armazenamento de alimentos devem ser dotados de tampas acionadas sem contato manual. | | |
| 20 | Resolution 216/2004 ANVISA - 4.2.2 Portaria CVS-5/2013 - Art. 73 | Os resíduos devem ser frequentemente coletados e estocados em local fechado e isolado da área de preparação e armazenamento dos alimentos, de forma a evitar focos de contaminação e atração de vetores e pragas urbanas. | | |
| 21 | Portaria CVS-5/2013 - Art. 74 | O lixo não deve sair da cozinha pelo mesmo local onde entram as matérias primas e nessa impossibilidade, determina horários diferentes para cada atividade. | | |
| *CHECKLIST* C - PEST CONTROL; WATER SUPPLY | | | | |
| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
| 1 | Resolution 216/2004 ANVISA - 4.3.1 | The building, facilities, equipment, furniture and fixtures must be free of vectors and urban pests. There must be a set of effective and continuous actions to control vectors and urban pests, with the aim of preventing their attraction, shelter, access and/or proliferation. | | |
| 2 | Resolution 216/2004 ANVISA - 4.3.2 | When the preventive measures adopted are not effective, chemical control must be employed and carried out by a specialized company, in accordance with specific legislation, with disinfectant products regulated by the Ministry of Health. | | |
| 3 | Resolution 216/2004 ANVISA - 4.3.3 | When applying chemical control, the specialized company must establish pre- and post-treatment procedures in order to avoid contamination of food, equipment and utensils. When applicable, equipment and utensils, before being reused, must be sanitized to remove residues of disinfectant products. | | |
| 4 | Resolution 216/2004 ANVISA - 4.4.1 | Only potable water should be used for food handling. | | |
| 5 | CVS-5/2013 - Art. 66 | The water used for direct consumption or in the preparation of food must come from a public supply, with the use of alternative solutions being allowed, such as water from wells, mines and other sources, after the use license granted by the competent body. | | |
| 6 | Resolution 216/2004 ANVISA - 4.4.1 CVS-5/2013 - Art. 67 | When an alternative water supply solution is used, potability must be certified every six months through laboratory reports, without prejudice to other requirements provided for in specific legislation. Potable water transported in a tanker truck must comply with the provisions of current legislation. The company supplying the water must present the analysis reports for this product, both to the purchasing establishment and to the sanitary authority. | | |
| 7 | Resolution 216/2004 ANVISA - 4.4.2 CVS-5/2013 - Art. 69 | Ice for use in food must be made from potable water, kept in hygienic-sanitary conditions to avoid contamination. | | |
| 8 | Resolution 216/2004 4.4.3 CVS-5/2013 - Art. 70 | Steam, when used in direct contact with food or surfaces that come into contact with food, must be produced from potable water and cannot represent a source of contamination. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
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| 9 | Resolution 216/2004 - 4.4.4 | The water reservoir must be built and/or coated with materials that do not compromise the quality of the water, according to specific legislation. | | |
| 10 | Resolution 216/2004 ANVISA - 4.4.4 CVS-5/2013 - Art. 68 | It must be free of cracks, leaks, infiltrations, peeling, among other defects and in an adequate state of hygiene and conservation, and must be properly covered. The water reservoir must be sanitized, within a maximum interval of six months, and records of the operation must be kept. | | |
| *CHECKLIST* D – FOOD HANDLER'S HYGIENE AND HEALTH | | | | |
| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
| 1 | Resolution 216/2004 4.6.1 CVS-5/2013 - Art. 8 | The health control of handlers must be registered and carried out in accordance with specific legislation. | | |
| 2 | Resolution 216/2004 ANVISA - 4.6.2 CVS-5/2013 - Art. 9 | Employees who have pathologies or injuries to the skin, mucous membranes and nails, wounds or cuts on the hands and arms, eye, lung or oropharyngeal infections and acute or chronic gastrointestinal infections/infestations must not handle food. The employee must be referred for medical examination and treatment, and removed from food handling activities, while these health conditions persist. | | |
| 3 | Resolution 216/2004 ANVISA - 4.6.3 e 4.6.6 CVS-5/2013 - Art. 10 | Cleanliness and aesthetics of food handlers: daily bath; beard and mustache shaved daily; short, clean nails without nail polish or base coat; light makeup. The use of adornments, for example: necklaces, amulets, bracelets, ribbons, earrings, piercings, watches, rings and wedding rings, among others, is prohibited. Objects necessary for use at work, such as pens, pencils, papers, thermometers, among others, must be placed in the lower pockets of the uniform. | | |
| 4 | Resolution 216/2004 ANVISA - 4.6.3 CVS-5/2013 - Art. 11 | Uniforms: well maintained and clean, changed daily and used only in the company's internal premises; trapped and fully protected hair; closed shoes, non-slip, in good conditions of hygiene and conservation; rubber boots, for cleaning and sanitizing the establishment or when necessary. | | |
| 5 | Resolution 216/2004 4.6.3 | Clothes and personal objects must be kept in a specific place and reserved for this purpose. | | |
| 6 | Resolution 216/2004 ANVISA - 4.6.4 CVS-5/2013 - Art. 12 e 13 | Employees must sanitize their hands whenever necessary and especially: upon arriving at work; use the toilets; coughing, sneezing or blowing your nose; use mops, cloths or cleaning materials; smoke; collect trash and other waste; touching sacks, boxes, bottles and shoes; touching unsanitized or raw food; there is an interruption of the service and start another one; take cash. | | |
| 7 | CVS-5/2013 - Art. 12 | Handling ready-to-eat foods that have undergone heat treatment or that will not be subjected to heat treatment, as well as handling already sanitized fruits and vegetables, must be carried out with previously cleaned hands, or with the use of utensils handling, or disposable gloves. These must be changed and discarded whenever the procedure is interrupted, or when non-hygienic products and surfaces are touched with the same gloves, to avoid cross-contamination. | | |
| 8 | Resolution 216/2004 ANVISA - 4.6.4 CVS-5/2013 - Art. 15 | Posters must be posted to guide handlers on correct hand washing and antisepsis and other hygiene habits, in easily visible places, including in sanitary facilities and washbasins.<br>Instructions for hand hygiene: moisten hands and forearms with water; wash with liquid soap, neutral, odorless and with antiseptic action. Massage well the hands, forearms, between the fingers and nails, for at least 3 minutes; rinse hands and forearms and dry them with non-recycled disposable paper towel or other non-contaminating procedure, and paper collector activated without manual contact. Hygiene products with antiseptic action must be approved by the National Health Surveillance Agency (ANVISA) for hand antisepsis. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 9 | Resolution 216/2004 ANVISA - 4.6.5<br><br>CVS-5/2013 - Art. 13 | During food manipulation, it is forbidden to talk, sing, whistle, cough, sneeze, spit on the products; chewing gum, toothpick, match or similar; sucking candies, eating or tasting food with your hands; touch the body, put your finger on your nose or ear, blow your nose, touch your hair or comb your hair; wipe sweat with hands, cloths or any other piece of clothing; smoke; touch doorknobs, cell phones or any other object unrelated to the activity; make use of dirty utensils and equipment; manipulate money and perform other acts that may contaminate food. | | |
| 10 | Resolution 216/2004 ANVISA - 4.6.6 | Handlers must wear hair tied up and protected by nets, caps or other suitable accessories for this purpose, not being allowed to wear a beard. Nails should be short and free of nail polish or base coat. During manipulation, all objects of personal adornment and makeup must be removed. | | |
| 11 | Resolution 216/2004 ANVISA - 4.6.7 | Food handlers must be periodically supervised and trained in personal hygiene, in hygienic food handling and in foodborne illnesses. Qualification must be supported by documentation. | | |
| 12 | Resolution 216/2004 ANVISA - 4.6.8 CVS-5/2013 - Art. 20 | All persons who are not part of the food staff are considered visitors. They must be minimally informed about Good Food Handling Practices and comply with the hygiene and health requirements established for employees. | | |
| 13 | CVS-5/2013 - Art. 20 | Visitors who, in the exercise of their functions, need to supervise or inspect Good Practices procedures, or perform maintenance and installation of equipment, must be properly uniformed with an apron, net or cap to protect their hair, and when necessary, with boots or protectors for the feet, provided by the company. | | |
| *CHECKLIST* E – RAW MATERIALS, INGREDIENTS, AND PACKAGING | | | | |
| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
| 1 | Resolution 216/2004 ANVISA - 4.7.1 | Food services must specify criteria for evaluating and selecting suppliers of raw materials, ingredients and packaging. | | |
| 2 | Resolution 216/2004 ANVISA - 4.7.1 CVS-5/2013 - Art. 21 | Deliveries of raw materials, ingredients, packaging, industrialized or ready-to-eat foods, as well as their transport vehicles, must present themselves in hygienic conditions. | | |
| 3 | Resolution 216/2004 ANVISA - 4.7.2 CVS-5/2013 - Art. 21 | Its reception must take place in an exclusive area for this purpose, protected from rain, sun, dust and free of useless materials or equipment. | | |
| 4 | Resolution 216/2004 4.7.2 CVS-5/2013 - Art. 21 | Measures must be taken to prevent these inputs from contaminating prepared food. | | |
| 5 | Resolution 216/2004 ANVISA - 4.7.3 CVS-5/2013 - Art. 23 | Upon receipt of raw materials, ingredients, industrialized or ready-to-eat foods, quantitative, qualitative and sensory evaluations (color, taste, odor, aroma, appearance, texture, consistency and flavor) of the products must be carried out in accordance with the standards of defined identity and quality. | | |
| 6 | Resolution 216/2004 4.7.3 CVS 5/2013 | The packaging of raw materials, ingredients, industrialized or ready-to-eat foods must be clean and intact, the words on the label must be checked. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 7 | Resolution 216/2004 ANVISA - 4.7.3 CVS-5/2013 - Art. 24 | The temperature of raw materials and ingredients that require special storage conditions must be checked during reception and storage.<br>Frozen: <-12°C or according to the manufacturer; Chilled: Fish (2 to 3°C or according to the manufacturer); Meat (4 to 7°C or according to the manufacturer); Other products (4 to 10°C or according to the manufacturer). | | |
| 8 | Resolution 216/2004 ANVISA - 4.7.4 CVS-5/2013 - Art. 29 | Products rejected at reception, or with expired validity, including those intended for return to the supplier, must be identified, placed in an appropriate place and outside the production area. It is not allowed to sell food with packaging that is dirty, torn and/or punctured; crushed, rusted and/or swollen cans. | | |
| 9 | Resolution 216/2004 ANVISA - 4.7.5 CVS-5/2013 - Art. 26 | Raw materials, ingredients and packaging must be stored in a clean and organized, ventilated place, without direct sunlight, free of debris or toxic material, and in accordance with the intrinsic characteristics of the food and the producer's recommendations, and to ensure protection against contaminants. They must be properly packaged and identified, and their use must respect the expiration date. For foods exempted from the obligation to indicate the expiry date, the order in which they are received must be observed. | | |
| 10 | CVS-5/2013 - Art. 27 | Single-use wooden packaging, coming directly from the manufacturer or producer, used for packaging salted and dried fish and some types of fruit, must be labeled and stored in exclusive refrigeration equipment. If this is not possible, they must be separated from other products. Other types of wooden boxes are prohibited in the storage areas. Cardboard boxes can remain under refrigeration or freezing, if stored in a delimited place, or in equipment exclusive for this purpose and must not show signs of humidity or mold. | | |
| 11 | Resolution 216/2004 ANVISA - 4.7.6 CVS-5/2013 - Art. 28 | Food, or food containers, must not be in direct contact with the floor. Raw materials, ingredients and packaging must be stored on pallets, shelves and/or pallets, which must maintain the necessary distances from the lining, walls and floor, to ensure adequate ventilation, cleaning and, where applicable, disinfection. of the place or the movement of people. Pallets, shelves and/or pallets must be made of smooth, resistant, waterproof and washable material. | | |
| 12 | CVS-5/2013 - Art. 25 | Industrialized foods, when packaged in the absence of consumers, must present the labeling information in accordance with current legislation: product name; list of ingredients; net content; company name, full address and CNPJ of the manufacturer (or the producer, or the importer, or the distributor); batch identification; expiration date; instructions on conservation, preparation and use of the product; and ANVISA or MAPA registration number, when applicable. Likewise, they must present the nutritional information required by current legislation: energy value, carbohydrates, proteins, total fat, saturated fat, trans fat, dietary fiber and sodium. | | |
| 13 | CVS-5/2013 - Art. 30 | Raw materials and ingredients that undergo fractionation or are transferred from their original packaging must be handled with an exclusive tool and packed in suitable containers, identified with the original label, or through labels containing: name of the supplier or manufacturer, name and brand of the product, storage method, expiry date and transfer date. | | |
| 14 | CVS-5/2013 - Art. 30 | Raw, manipulated, partially cooked or ready-to-eat prepared foods must be stored under refrigeration, protected and identified with at least the following information: designation, date of preparation and expiration date. | | |
| 15 | CVS-5/2013 - Art. 31 | Pack food intended for refrigeration in volumes that allow adequate cooling of the geometric center of the product. When there is a need to store different foods in the same refrigerator, ready-to-eat foods must be arranged on the upper shelves, pre-prepared foods on the middle shelves and raw products on the lower shelves, separated from each other and from other products. The refrigerator must be set to the food that needs the lowest temperature. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 16 | CVS-5/2013 - Art. 32 | Raw, or minimally processed products, or that exude an odor, or ooze must be stored in equipment other than thermally processed products. Do not store food under condensers and evaporators in cold rooms to avoid contamination. | | |
| 17 | CVS-5/2013 - Art. 33 | Refrigeration equipment and freezers must be in good condition and hygienic and adequate for the volume of product stored. It is forbidden to turn them off in order to save energy and to use glass rod thermometers to control their temperatures. | | |
| 18 | CVS-5/2013 - Art. 34 | The storage temperatures of products under freezing and under refrigeration must comply with the manufacturers' recommendations indicated on the labels. In the absence of this information and for food prepared in the establishment, the following recommendations should be used: I - frozen: 0 to -5°C expire 10 days; -6 to -10°C expire 20 days; -11 to -18°C expire 30 days; <-18°C expire 90 days. II - colds: max. 2°C expire 3 days: fish and raw processed products; max. 2°C expire 1 day: post-cooking fish; max. 4°C expire 3rd day: other post-cooking foods; raw meat and its processed products; cold and sausages, sliced, chopped or ground; desserts and other preparations with dairy products; other prepared foods. Max. 4°C expire 2 days: mixed skewers, rolled steak, raw breaded meats and preparations with ground meat; mayonnaise and mixtures of mayonnaise with other foods; Max. 5°C expire 5 days: Bakery and confectionery with toppings and fillings, ready for consumption; Max. 5°C expire 3 days: Sanitized, fractionated or peeled fruits and vegetables; fruit juices and pulps; Max. 7°C expire 5 days: milk and derivatives; Max. 10°C expire 7 days: eggs. | | |
| 19 | Resolution 216/2004 ANVISA - 4.8.1 | Raw materials, ingredients and packaging used for food preparation must be in adequate hygienic-sanitary conditions and in compliance with specific legislation. | | |
| 20 | CVS-5/2013 - Art. 43 | Use of eggs: eggs can be contaminated with Salmonella, both in the shell and in the yolk. Food services must recognize the quality of their egg suppliers and laying birds must not be contaminated with *Salmonella*. | | |
| 21 | CVS-5/2013 - Art. 43 | Store eggs preferably refrigerated. Check the expiration date of the eggs. | | |
| 22 | CVS-5/2013 - Art. 54 | Vehicles transporting food ingredients and raw materials, food packaging, must have the driver's cabin isolated from a closed cargo compartment. They must be in good condition, free of products, substances, animals, people and objects foreign to the activity of transporting food, sanitized and with the temperature of the cargo compartment in accordance with the transported loads. | | |
| 23 | CVS-5/2013 - Art. 56 | Ingredients and raw materials and packaging for food, prepared or industrialized food, whether or not ready for consumption, must not be transported in direct contact with the floor of the cargo compartment, when their nature or their packaging so require. To avoid damage or contamination, they must be separated and protected on shelves, pallets or pallets and these, as well as all materials used to separate and protect the cargo, must not constitute a source of contamination for the transported products, and must be sanitized in the same way. way that cargo compartment. | | |
| *CHECKLIST* F – FOOD PRE-PREPARATION AND PREPARATION | | | | |
| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
| 1 | Resolution 216/2004 ANVISA - 4.8.7 | When applicable, before starting food preparation, the primary packaging of raw materials and ingredients must be adequately cleaned, minimizing the risk of contamination. | | |
| 2 | Resolution 216/2004 ANVISA - 4.8.20 | The number of employees, equipment, furniture and/or utensils available must be compatible with the volume, diversity and complexity of food preparations. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 3 | Resolution 216/2004 ANVISA - 4.8.3 CVS-5/2013 - Art. 35 | During food preparation, measures must be taken to minimize the risk of cross-contamination. | | |
| 4 | Resolution 216/2004 ANVISA - 4.8.3 CVS-5/2013 - Art. 35 | Avoid direct or indirect contact between raw, semi-prepared and ready-to-eat foods. | | |
| 5 | Resolution 216/2004 ANVISA - 4.8.4 | Employees who handle raw foods must wash and disinfect their hands before handling prepared foods. | | |
| 6 | Resolution 216/2004 ANVISA - 4.8.5 | Raw materials and ingredients characterized as perishable products must be exposed to room temperature only for the minimum time necessary for food preparation, in order not to compromise the hygienic-sanitary quality of the prepared food. | | |
| 7 | Resolution 216/2004 ANVISA - 4.8.6 | When raw materials and ingredients are not used in their entirety, they must be properly packaged and identified with at least the following information: product designation, fractioning date and expiration date after opening or removing the original packaging. | | |
| 8 | CVS-5/2013 - Art. 35 | Products in original, clean wooden or cardboard packaging may enter the pre-preparation area, and products in original waterproof packaging must be washed before opening, whenever possible. | | |
| 9 | Resolution 216/2004 ANVISA - 4.8.13 CVS-5/2013 - Art. 37 | Defrosting food must be carried out according to the manufacturer's recommendations. It is forbidden to defrost food at room temperature. Fast defrosting can be done in a microwave oven. Slow thawing must be carried out under refrigeration at a temperature <5°C. After thawing, the product must not be refrozen. | | |
| 10 | CVS-5/2013 - Art. 38 | To desalt meat and fish, follow the manufacturer's recommendations, or use drinking water under refrigeration up to 5°C, or in boiling water. | | |
| 11 | CVS-5/2013 - Art. 39 - pré-preparo | The cleaning of fruit and vegetables must be done in an appropriate place, with potable water and disinfectant products for use in food, regulated by ANVISA, and must follow the instructions recommended by the manufacturer. Hygienization comprises the mechanical removal of deteriorated parts and dirt under running drinking water, followed by disinfection by immersion in a disinfectant solution.<br>When this is carried out with a chlorinated solution, the fruit and vegetables must remain immersed for 15 to 30 minutes, followed by a final rinse with potable water. Dilution recommendations for the disinfectant chlorinated solution: I - 10mL or a level tablespoon of sodium hypochlorite at a concentration of 2 to 2.5%, diluted in 1L of drinking water; II - 20mL or two level tablespoons of sodium hypochlorite at a concentration of one percent, diluted in 1L of drinking water. | | |
| 12 | CVS-5/2013 - Art. 40 | Easily visible and understandable instructions must be posted on the correct procedure for cleaning horticultural products in the place where this operation takes place. | | |
| 13 | Resolution 216/204 ANVISA - 4.8.12 | For frozen foods, prior to heat treatment, thawing must be carried out in order to ensure adequate heat penetration. Exceptions are made for cases in which the food manufacturer recommends that it be subjected to heat treatment while still frozen, and the guidelines on the label must be followed. | | |
| 14 | Resolution 216/2004 ANVISA - 4.8.14 | Food subjected to thawing must be kept refrigerated if not used immediately, and must not be refrozen. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 15 | Resolution 216/2004 ANVISA - 4.8.8 CVS-5/2013 - Art. 41 | Cooking is the stage where food is subjected to heat treatment for a time determined by the product, which must reach a minimum of 74°C [70°C Res. 261/2004] in its geometric center. Other operations, combining a duration time under a certain temperature, can be used, as long as they are sufficient to ensure the hygienic-sanitary quality of the food in question. The effectiveness of the heat treatment must be evaluated by checking the temperature and time used and, when applicable, by changes in texture and color in the central part of the food. | | |
| 16 | Resolution 216/2004 ANVISA - 4.8.10 | For foods subjected to frying, in addition to the controls established for heat treatment, measures must be instituted to ensure that the oil and fat used do not constitute a source of chemical contamination of the prepared food. | | |
| 17 | Resolution 216/2004 ANVISA - 4.8.11 CVS-5/2013 - Art. 41 | The oils and fats used must be heated to temperatures not exceeding 180°C; reuse can only be carried out when it does not present any changes in sensory characteristics such as color, taste and odor, or does not present foam and smoke formation. If this occurs, it should be ignored; to be reused, the oil must be filtered through proper filters. | | |
| 18 | CVS-5/2013 - Art. 41 | The oil cannot be disposed of in the sewer system or in rainwater, because it clogs pipes and causes pollution; Used and unusable frying oils must be recycled by companies that use them to manufacture biodiesel, soaps and paints. | | |
| 19 | Resolution 216/2004 ANVISA - 4.8.15 | After being subjected to cooking, prepared foods must be kept in time and temperature conditions that do not favor microbial multiplication. For hot storage, food must be subjected to a temperature greater than 60°C for a maximum of 6 hours. For conservation under refrigeration or freezing, foods must be previously submitted to the cooling process. | | |
| 20 | CVS-5/2013 - Art. 43 | Preparations in which the eggs remain raw or undercooked are prohibited. Boiled eggs should be boiled for 7 minutes and fried eggs should have a hard yolk. | | |
| 21 | CVS-5/2013 - Art. 43 | Pasteurized, dehydrated or cooked eggs must be used in preparations without cooking, such as mayonnaise, creams, mousses, among others. | | |
| 22 | CVS-5/2013 - Art. 43 | The contents of the egg must not come into contact with the outer surface of the shell; It is forbidden to use eggs with a cracked or dirty shell in food preparations. | | |
| 23 | CVS-5/2013 - Art. 43 | Egg washing is not recommended. | | |
| 24 | Resolution 216/2004 ANVISA - 4.8.16 CVS-5/2013 - Art. 44 e 45 | The cooling process of prepared food must be carried out in such a way as to minimize the risk of cross-contamination and its permanence at temperatures that favor microbial multiplication. The temperature of prepared food must be reduced from 60°C to 10°C within 2 hours. Afterwards, it must be kept refrigerated at temperatures lower than 5°C, or frozen at a temperature equal to or lower than -18°C. | | |
| 25 | Resolution 216/2004 ANVISA - 4.8.17 | The maximum period of consumption of food prepared and stored under refrigeration at a temperature of 4°C or lower must be 5 days. When temperatures above 4°C and below 5°C are used, the maximum period of consumption must be reduced, in order to guarantee the hygienic-sanitary conditions of the prepared food. | | |
| 26 | Resolution 216/2004 ANVISA - 4.8.18 CVS-5/2013 - Art. 44 | If the prepared food is stored under refrigeration or freezing, at least the following information must be placed on its wrapping: designation, date of preparation and expiry date. Storage temperature should be regularly monitored and recorded. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 27 | Resolution 216/2004 ANVISA - 4.8.19 | When applicable, foods to be consumed raw must undergo a cleaning process in order to reduce surface contamination. The products used in food hygiene must be regulated by the competent body of the Ministry of Health and be applied in such a way as to avoid the presence of residues in the prepared food. | | |
| 28 | Resolution 216/2004 -4.8.20 | The establishment must implement and maintain documented control and quality assurance of prepared foods. | | |
| *CHECKLIST* G – STORAGE, DISTRIBUTION, AND TRANSPORTATION OF PREPARED FOOD | | | | |
| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
| 1 | Resolution 216/2004 ANVISA - 4.9.1 | Prepared foods held in the storage area or awaiting transport must be identified and protected from contaminants. The identification must contain, at least, the designation of the product, the date of preparation and the expiry date. | | |
| 2 | Resolution 216/2004 ANVISA - 4.9.2 | The storage and transport of prepared food, from distribution to delivery to consumption, must take place in time and temperature conditions that do not compromise its hygienic-sanitary quality. The temperature of prepared food should be monitored during these steps. | | |
| 3 | Resolution 216/2004 ANVISA - 4.9.3 | The means of transporting the prepared food must be sanitized, and measures must be taken to ensure the absence of vectors and urban pests. The vehicles must be equipped with a cover to protect the cargo, and must not carry other cargoes that compromise the hygienic-sanitary quality of the prepared food. | | |
| 4 | CVS-5/2013 - Art. 53 | Vehicles transporting food must have a smooth, impermeable, non-toxic and resistant internal coating to hygiene procedures, to transport manipulated foods ready or not for consumption; thermal control in the cargo compartment, according to the type of food product transported. | | |
| 5 | CVS-5/2013 - Art. 54 | Vehicles transporting ready-to-eat or non-eating prepared foods must have the driver's cabin isolated from a closed cargo compartment. They must be in good condition, free of products, substances, animals, people and objects foreign to the activity of transporting food, sanitized and with the temperature of the cargo compartment in accordance with the transported loads. | | |
| 6 | CVS-5/2013 - Art. 55 | Food services that transport food must have Standard Operating Procedures that describe the method of cleaning vehicles and how often they are carried out. If the method is chemical, using cleaning and disinfection products registered with ANVISA, the method, the frequency of use, the active ingredients and the concentration of the cleaning and disinfection solutions used, and the temperatures and times of contact of disinfectant solutions with the surfaces being cleaned.<br>The products used must not leave residues or odors that could contaminate food. If the method is physical, using steam, the method, its frequency of use, the temperature and the time of contact of the steam with the surfaces being cleaned must be described. | | |
| 7 | CVS-5/2013 - Art. 56 | Prepared or industrialized foods, whether ready for consumption or not, must not be transported in direct contact with the floor of the cargo compartment, when their nature or packaging so require.<br>To avoid damage or contamination, they must be separated and protected on shelves, pallets or pallets and these, as well as all materials used to separate and protect the cargo, must not constitute a source of contamination for the transported products, and must be sanitized in the same way. way that the cargo bay. | | |
| 8 | CVS-5/2013 - Art. 57 | Concomitant transport, in the same cargo compartment, of prepared or industrialized raw, semi-processed or ready-to-eat foods with ingredients, raw materials and food packaging is not permitted, if these represent a risk of cross-contamination with the former. | | |
| 9 | CVS-5/2013 - Art. 58 | During the transport of raw, semi-processed or ready-to-eat prepared or industrialized foods, when presented in volumes to be divided, the products must present a label with at least the following information: name of the product, name of the producing company with your complete address and CNPJ, expiry date and instructions on conservation. | | |

| # | REGULATION | CRITERIA OF THE REGULATION | C / NC | NOTES: |
|---|---|---|---|---|
| 10 | CVS-5/2013 - Art. 59 | The transport of food must be carried out under conditions of time and temperature that prevent contamination and the development of pathogenic microorganisms to humans. | | |
| 11 | CVS-5/2013 - Art. 60 | Raw, semi-processed or ready-to-eat prepared or industrialized perishable foods, which must be kept under refrigeration or freezing, must be transported in closed cargo compartments with the temperature controlled by a fixed, calibrated and easy-to-read thermometer. When being loaded, the cargo compartment must be preconditioned with the temperature of the food product that requires the lowest storage temperature. | | |
| 12 | CVS-5/2013 - Art. 61 | During the entire period of transport, for hours or days, prepared or industrialized, raw, semi-processed or ready-to-eat perishable foods, which need to be preserved under freezing or refrigeration, must comply with the temperatures pre-established. | | |
| 13 | CVS-5/2013 - Art. 46 | Food displayed for immediate consumption must be protected against dust, insects and other urban pests, and against contaminants from consumers, such as droplets of saliva and hair, and also, far from sanitizers, hygiene products and other toxic products. . | | |
| 14 | Resolution 216/2004 ANVISA - 4.10.1 | The areas for displaying prepared and consuming food or the cafeteria must be kept organized and in adequate hygienic-sanitary conditions. The equipment, furniture and utensils available in these areas must be compatible with the activities, in sufficient numbers and in an adequate state of conservation. | | |
| 15 | Resolution 216/2004 ANVISA - 4.10.2 | Handlers must adopt procedures that minimize the risk of contamination of prepared foods through hand antisepsis and the use of disposable utensils or gloves. | | |
| 16 | Resolution 216/2004 ANVISA - 4.10.3 | The equipment necessary for displaying or distributing food prepared under controlled temperatures must be properly sized and in an adequate state of hygiene, conservation and functioning. The temperature of such equipment must be regularly monitored. | | |
| 17 | Resolution 216/2004 ANVISA - 4.10.4 | The food display equipment prepared in the consumption area must have protection barriers that prevent contamination from the same as a result of the proximity or action of the consumer and other sources. | | |
| 18 | Resolution 216/2004 ANVISA - 4.10.5 | Utensils used in the consumption of food, such as plates, cups, cutlery, must be disposable or, when made of non-disposable material, properly sanitized and stored in a protected place. | | |
| 19 | Resolution 216/2004 ANVISA - 4.10.6 CVS-5/2013 - Art. 49 | The ornaments located in the consumption area or cafeterias must not constitute a source of contamination for prepared foods. They must not be between the airflow and the food, nor on the distribution counters. Fans and air conditioning are permitted, as long as the air flow is not directly on the ornaments and food. | | |
| 20 | Resolution 216/2004 ANVISA - 4.10.7 | The food service area where cash, cards and other means used to pay expenses are received must be reserved. Employees responsible for this activity must not handle prepared foods, whether packaged or not. | | |
| 21 | CVS-5/2013 - Art. 47 | Food displayed for immediate consumption must comply with the criteria of times x temperatures. Foods that do not meet these criteria should be discarded.<br>Hot food: min. 60°C at the geometric center - exposure time max. 6 am; below 60°C at the geometric center - exposure time max. 1am.<br>Cold food: up to 10°C at the geometric center - exposure time max. 4 am; between 10 to 21°C at the geometric center - exposure time max. 2am. | | |
| 22 | CVS-5/2013 - Art. 48 | The water in the thermal counter must be changed daily and kept at a temperature of 80 to 90°C. This temperature must be measured during the dispensing time. | | |

Facility layout.

1- Restaurant entrance
2- Female bathroom
3- Male bathroom
4- Restaurant
5- Buffet
6- Administration
7- Labeling
8- Inspection's office
9- Expedition
10- Distribution
11- Thermal containers
12- Desserts
13- Snacks
14- Pre-preparation
15- Butchery
16- Material storage
17- Kitchen – ovens area
18- Kitchen – stove area
19- Kitchen – special meals
20- Kitchen – cooking boilers
21- Buffet's washing area
22- Kitchen washing area
23- Emergency exit
24- Pan storage
25- Cleaning material department – clean area
26- Cleaning material department – unclean area
27- Engine room from the cold storage chambers
28- Dry goods storage
29- Administration
30- Vegetables chamber
31- Prepared and ready-to-eat products cold storage chamber
32- Frozen products cold storage chamber
33- Chilled products cold storage chambers
34- Receiving area
35- Waste cold storage chamber (garbage)
36- Plastic box washing area
37- Material storage
38- Female bathroom
39- Male bathroom
40- Female locker room
41- Male locker room
42- Entrance corridor
43- Truck entrance
44- Package storage
45- Bathroom corridor to the kitchen access
46- Butchery, pre-preparation and Snacks corridor
47- Receiving area corridor to the kitchen access
48- Main access corridor
49- Restaurant exit
a- Filter water
b- Tap water

**ANEXO III -** Supplementary Data B - Terms of Consent

Ethics Committee Resolution 466/2012 - (participant over 18 years old)

I hereby INVITE you to participate in the Research Project entitled "Detection and reduction of pathogens in a hospital food and nutrition unit through the use of Good Manufacturing Practices", which will be developed by me, Dionice Capistrano da Silva, Veterinary Doctor, with guidance from the Veterinarian and Professor Juliano Gonçalves Pereira from (Faculty of Veterinary Medicine and Animal Science of Botucatu – UNESP).

I am studying bacterial cross-contamination during food handling. Therefore, to obtain a result at the handling moment, I need to perform a light swab in the palm of one of your hands and between fingers, and this will be submitted to the following microbiological tests: total count of aerobic mesophilic bacteria, *Escherichia coli*, and *Staphylococcus* positive-coagulase. The sampling is superficial, non-invasive, painless, with an average duration of 40 seconds, and the moistening liquid is composed of water and salt, with no health risks. At the same time, the microbiological levels in foods that may pose a risk to the health of the final consumer (hospitalized patient) will be surveyed.

I inform you that after carrying out the analyzes, the swab will be discarded and the bacteria, if isolated, will be kept stored in the laboratory's bacteria collection, which can be used in a new research project, with your signed permission to use this material. For this study, it will not be necessary to consult a medical record or a history of medical appointments previously made by you. No filming or photography will be done, and no additional information beyond this form will be taken.

Your participation will not generate costs and will lead to future benefit in the pursuit of excellent food handling practices in order to promote the control and reduction of microorganisms that cause foodborne hospital infections. Please be aware that your participation in this study is voluntary and that even after you have given your consent to participation in the research, you may withdraw it at any time.

You will be guaranteed the right to full and free assistance in case of any damages arising from participation in this research and for as long as necessary. You have the right to seek compensation for any damages resulting from this research. This Consent Form will be prepared in 2 copies of

equal content, 01 of which will be delivered to you duly signed, and the other copy will be filed and kept by the researchers for a period of 5 years after the end of the search.

If you have any additional questions, you can contact the Research Ethics Committee by calling +55 14 3880-1608 or 3880-1609, which is open from Monday to Friday from 8:00 am to 12:00 pm and from 1:30 pm to 5:00 pm, at Chácara Butignolli s/nº in Rubião Júnior – Botucatu - São Paulo. The location data of the researchers are described below:

Name: Dionice Capistrano da Silva Address: R. João Coelho da Silva, 425 Botucatu/São Paulo +55 14 99682-2355 E-mail: dionice.capistrano@unesp.br

Name Juliano Gonçalves Pereira Address: Prof. doctor Walter Maurício Correa s/n Botucatu/São Paulo. Phone: +55 14 3880-2258 E-mail: juliano.pereira@unesp.br

After all my doubts regarding this study have been resolved, I AGREE to participate voluntarily, being aware that all my data will be safeguarded through the secrecy that the researchers have committed to. I am aware that the results of this study may be published in scientific journals.

Botucatu, _____/___/_____

_____ _____

Researcher Participant

**ANEXO IV -** Supplementary Data C – Molecular characterization of *Listeria monocytogenes* isolated before (first round) and after (second round) the intervention for the microbiological assessment of surfaces and foods from the hospital kitchen.

| Round | Area | Source | Serotype | *orf 2819* | *orf 2110* | *lmo 0737* | *lmo 1118* | *inl A* | *inl B* | *inl C* | *hly A* | *act A* | *prf A* | *fla A* | *agr A* | *agr B* | *agr C* | *agr D* | *lux S* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st | | Celery | 1/2a | | | p | | p | p | p | p | | p | p | p | p | p | p | |
| 1st | | Chiken cutting board | 4b | p | p | | | p | p | p | p | | p | p | p | p | p | p | p |
| 1st | | Chicken strips | 1/2a | | | p | | p | p | p | p | | p | p | p | p | p | p | |
| 1st | | Refrigerator | 4b | p | p | | | p | p | p | p | p | p | p | p | p | p | p | p |
| 1st | | Beef strips | 4b | p | p | | | p | p | p | p | p | p | p | p | p | p | p | p |
| 1st | | Refrigerator | 4b | p | p | | | p | p | p | p | p | p | p | p | p | p | p | p |
| 2nd | | Chicken cuttin board | 4b | p | p | | | p | | | p | p | | p | p | p | p | p | |
| 2nd | | Beef cutting board | 1/2a | p | | p | | | | | p | p | | | | p | p | | |
| 2nd | | Package | 1/2a | p | | p | | p | | | p | p | | | | p | p | | |
| 2nd | | Package | 1/2a | p | | p | | p | | | p | p | | | | p | p | | |
| 2nd | | Stailess steel cart | 1/2a | p | | p | | p | p | | p | p | | | | p | p | p | |

**Source of the LM isolates:**

Pre-preparation area

Butchery area

p presence

**ANEXO V -** Supplementary Table I - Number of samples collected before and after the intervention to assess the effectiveness of the GMP in the hospital kitchen.

| Sampling criteria | Swab of surfaces | | Foods | Water | Air | Hand |
|---|---|---|---|---|---|---|
| | AMC and EB | LM | | | | |
| Total | [233 / 233][1] | [130 / 130] | [28 / 21] | [19 / 19] | [33 / 29] | [32 / 43] |
| **By area** | | | | | | |
| Butchery | 42 / 42 | 28 / 28 | 5 / 6 | 3 / 3 | 3 / 2 | 4 / 5 |
| Cold storage | 10 / 10 | 9 / 9 | 3 / 2 | - | 9 / 5 | - |
| Kitchen | 45 / 45 | 25 / 25 | 7 / 5 | 1 / 4 | 5 / 4 | 8 / 12 |
| Distribution | 08 / 08 | 4 / 4 | 1 / 1 | - | 2 / 2 | - |
| Snacks | 48 / 48 | 24 / 24 | 2 / 2 | 3 / 1 | 3 / 2 | 6 / 5 |
| Pre-preparation | 36 / 36 | 18 / 18 | 6 / 4 | 5 / 4 | 2 / 3 | 10 / 9 |
| Dessert | 44 / 44 | 22 / 22 | 4 / 2 | 4 / 6 | 3 / 5 | 4 / 12 |
| Other non-production area | - | - | - | 3 / 1 | 6 / 6 | - |
| **By moment** | | | | | | |
| AC | 130 / 130 | 130 / 130 | - | V | - | - |
| DS | 103 / 103 | 0 / 0 | - | V | - | - |
| **By type of surface** | | | | | | |
| FC | 128 / 128 | 74 / 74 | - | - | - | - |
| WFC | 105 / 105 | 56 / 56 | - | - | - | - |
| **By food group** | | | | | | |
| A- Raw materials | - | - | 1 / 4 | - | - | - |
| B-Pre-prepared and prepared | - | - | 8 / 9 | - | - | - |
| C- Prepared and ready-to-eat | - | - | 3 / 1 | - | - | - |
| D- Cooked | - | - | 15/ 7 | - | - | - |
| E- Ready-to-eat | - | - | 1 / 0 | - | - | - |
| **By water source** | | | | | | |
| Tap | - | - | - | 14 / 14 | - | - |
| Filter | - | - | - | 5 / 5 | - | - |
| **By work moment** | | | | | | |
| Before hand wash | - | - | - | - | - | 16 / 14 |
| After hand wash | - | - | - | - | - | 0 / 15 |
| During food handling | - | - | - | - | - | 16 / 14 |

[1] number of samples [before intervention / after intervention]; AMC: aerobic mesophilic count; EB: *Enterobacteriaceae* count; LM: *Listeria monocytogenes*; AC: after cleaning; DS: during shift; FC: surface with food contact; WFC: surface without food contact; v: sampling moment varied between AC and DS.

**ANEXO VI -** Supplementary Table II - Microbiological criteria and analytical methods per type of samples collected in the hospital kitchen to assess improvements in GMP before and after the intervention (legends indicate the references of the criteria used in the analyses for each group of samples).

| Microorganisms | Surfaces swabs | Foods | Water | Air | Hand |
|---|---|---|---|---|---|
| Aerobic mesophilic count (AMC) | AOAC 990.12[1] [1] | ISO 4833-1[2] [2] | - | - | AOAC 990.12[5] [1] |
| Coliforms at 36 °C | - | - | APHA, 1999[3] [3] | - | - |
| Coliforms at 45 °C | - | - | APHA, 1999[3] [3] | - | - |
| *Bacillus cereus* (BC) | - | ISO 7932[2] [4] | - | - | - |
| *Enterobacteriaceae* (EB) | AOAC 2003.01[1] [5] | - | - | - | - |
| *Escherichia coli* (EC) | - | AOAC 998.08[2] [6] | APHA, 1999[3] [3] | - | AOAC 2003.01[5] [5] |
| *Enterococcus* sp. (EN) | | - | APHA, 1999[3] [3] | - | - |
| *Listeria monocytogenes* (LM) | MLG 8.13[1] [7] | ISO 11290-1[2] [8] | - | - | - |
| *Pseudomonas* sp. (PS) | - | - | APHA, 1999[3] [3] | - | - |
| *Staphylococcus* coagulase-positive (CPS) | - | ISO 6888-1[2] [9] | - | - | ISO 6888-1[5] [9] |
| *Salmonella* sp. (SS) | - | ISO 6579[2] [10] | - | - | - |
| Yeasts and molds (YM) | - | ISO 6611-IDF[2] [11] | - | SANCO 12116/2012[4] [12] | - |

[1] Decision (CE) 2001/417 [13]; Regulation (CE) no. 2073/2005 [14]; [2] Normative no. 161/2022 [15]; [3] Regulation GM/MS no. 888/2021 [16]; Normative no. 161/2022 [15]; [4] SANCO 12116/2012 [12]; [5] WHO, 2009 [17]; Resolution no. 752/2022 [18]

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**ANEXO VII -** Supplementary Table III - Primers to molecular characterization of the *Listeria monocytogenes* isolates.

| Gene | Primers | Reference |
|---|---|---|
| *Prs* | F: GCTGAAGAGATTGCGAAAGAAG<br>R: CAAAGAAACCTTGGATTTGCGG | [1] |
| *Imo0737* | F: AGGGCTTCAAGGACTTACCC<br>R: ACGATTTCTGCTTGCCATTC | [1] |
| *Imo1118* | F: AGGGGTCTTAAATCCTGGAA<br>R: CGGCTTGTTCGGCATACTTA | [1] |
| *ORF2819* | F: AGCAAAATGCCAAAACTCGT<br>R: CATCACTAAAGCCTCCCATTG | [1] |
| *ORF2110* | F: AGTGGACAATTGATTGGTGAA<br>R: ATCCATCCCTTACTTTGGAC | [1] |
| *InlA* | F: ACGAGTAACGGGACAAATGC<br>R: CCCGACAGTGGTGCTAGATT | [2] |
| *InlB* | F: TGGGAGAGTAACCCAACCAC<br>R: GTTGACCTTCGATGGTTGCT | [2] |
| *InlC* | F: AATTCCCACAGGACACAACC<br>R: CGGGAATGCAATTTTTCACTA | [2] |
| *HlyA* | F: GCAGTTGCAAGCGCTTGGAGTGAA<br>R: GCAACGTATCCTCCAGAGTGATCG | [3] |
| *ActA* | F: CGCCGCGGAAATTAAAAAAAGA<br>R: ACGAAGGAACCGGGCTGCTAG | [4] |
| *PrfA* | F: GGAAGCTTGGCTCTATTTGC<br>R: ACAGCTGAGCTATGTGCGAT | [5] |
| *FlaA* | F: GTAAGCATCCAAGCGTCTGA<br>R: AAGAATCAGCATCAGCAACG | [5] |
| *AgrA* | F: CGGGTACTTGCCTGTATGAA<br>R: TGAATAGTTGGCGCTGTCTC | [6] |
| *AgrB* | F: AGGTACATTTGGATTTATACTGCTCAAC<br>R: TCTTCACCGATTAAAGGCAAACT | [6] |
| *AgrC* | F: ATTGACAAGATTTCGATGGATAGTATAGATT<br>R: CACAAGTTAACGCCGCTTCA | [6] |
| *AgrD* | F: AAATCAGTTGGTAAATTCCTTTCTAG<br>R: AATGGACTTTTTGGTTCGTATACA | [7] |
| *LuxS* | F: AAGCACCTTTTGTGAGACTGG<br>R: CCGTTAGTGTTGTAGCGATGA | [8] |

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**ANEXO VIII**- Supplementary Table IV - Microbiological results of the food, water, air and hands sampled before and after the GMP intervention.

Results in log CFU/g or mL: AMC: aerobic mesophilic count; EC: *Escherichia coli*; BC: *Bacillus cereus*; CPS: *Staphylococcus* positive-coagulase; CSR: *Clostridium* sulphide-reductor; YM: yeasts and molds; PS: *Pseudomonas* sp; EN: *Enterococcus* sp. Results in presence or absence in 25g or mL (0= absence; 1=presence): SS: *Salmonella* sp.; LM: *Listeria monocytogenes*. Results in log MPN/ mL = WC36: coliforms at 36ºC in water; WC45: coliforms at 45ºC in water; WEC: *Escherichia coli* in water.

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/1-AL1 | Before action plan | 1 | Distribution | Food | D. Cooked (Boiled rice without salt) | SS | 0 |
| C1/1-AL1 | Before action plan | 1 | Distribution | Food | D. Cooked (Boiled rice without salt) | LM | 0 |
| C1/1-AL2 | Before action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | LM | 0 |
| C1/1-AL2 | Before action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | SS | 0 |
| C1/1-AL2 | Before action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | EC | <1.0 |
| C1/1-AL2 | Before action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | CPS | <1.0 |
| C1/1-AL3 | Before action plan | 1 | Kitchen | Food | D. Cooked (Ground meat cooked without salt) | EC | <1.0 |
| C1/1-AL3 | Before action plan | 1 | Kitchen | Food | D. Cooked (Ground meat cooked without salt) | SS | 0 |
| C1/1-AL3 | Before action plan | 1 | Kitchen | Food | D. Cooked (Ground meat cooked without salt) | LM | 0 |
| C1/1-AL3 | Before action plan | 1 | Kitchen | Food | D. Cooked (Ground meat cooked without salt) | CPS | <1.0 |
| C1/1-AL4 | Before action plan | 1 | Dessert | Food | D. Cooked (Sweet rice) | SS | 0 |
| C1/1-AL4 | Before action plan | 1 | Dessert | Food | D. Cooked (Sweet rice) | LM | 0 |
| C1/1-AL4 | Before action plan | 1 | Dessert | Food | D. Cooked (Sweet rice) | BC | <1.0 |
| C1/1-AL4 | Before action plan | 1 | Dessert | Food | D. Cooked (Sweet rice) | AMC | 4.67 |
| C1/1-AL5 | Before action plan | 1 | Pre-preparation | Food | A. Raw material (Unsterilized celery) | SS | 0 |
| C1/1-AL5 | Before action plan | 1 | Pre-preparation | Food | A. Raw material (Unsterilized celery) | LM | 1 |
| C1/1-AL5 | Before action plan | 1 | Pre-preparation | Food | A. Raw material (Unsterilized celery) | CPS | <1.0 |
| C1/1-AL6 | Before action plan | 1 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped celery) | SS | 0 |
| C1/1-AL6 | Before action plan | 1 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped celery) | LM | 0 |
| C1/1-AL6 | Before action plan | 1 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped celery) | CPS | <1.0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/1-AL7 | Before action plan | 1 | Cold chamber | Food | B. Pre-prepared / prepared (Sliced ham) | SS | 0 |
| C1/1-AL7 | Before action plan | 1 | Cold chamber | Food | B. Pre-prepared / prepared (Sliced ham) | LM | 0 |
| C1/1-AL7 | Before action plan | 1 | Cold chamber | Food | B. Pre-prepared / prepared (Sliced ham) | SC | <1.0 |
| C1/1-ÁGUA1 | Before action plan | 1 | Kitchen | Water | Tap | PS | 0 |
| C1/1-ÁGUA1 | Before action plan | 1 | Kitchen | Water | Tap | WC36 | <3 |
| C1/1-ÁGUA1 | Before action plan | 1 | Kitchen | Water | Tap | WC45 | <3 |
| C1/1-ÁGUA1 | Before action plan | 1 | Kitchen | Water | Tap | WEC | <3 |
| C1/1-ÁGUA2 | Before action plan | 1 | Snacks | Water | Tap | PS | 0 |
| C1/1-ÁGUA2 | Before action plan | 1 | Snacks | Water | Tap | WC36 | <3 |
| C1/1-ÁGUA2 | Before action plan | 1 | Snacks | Water | Tap | WC45 | <3 |
| C1/1-ÁGUA2 | Before action plan | 1 | Snacks | Water | Tap | WEC | <3 |
| C1/1-ÁGUA3 | Before action plan | 1 | Butchery | Water | Tap | PS | 0 |
| C1/1-ÁGUA3 | Before action plan | 1 | Butchery | Water | Tap | WC36 | <3 |
| C1/1-ÁGUA3 | Before action plan | 1 | Butchery | Water | Tap | WC45 | <3 |
| C1/1-ÁGUA3 | Before action plan | 1 | Butchery | Water | Tap | WEC | <3 |
| C1/1-ÁGUA4 | Before action plan | 1 | Dessert | Water | Tap | PS | 0 |
| C1/1-ÁGUA4 | Before action plan | 1 | Dessert | Water | Tap | WC36 | 3.04 |
| C1/1-ÁGUA4 | Before action plan | 1 | Dessert | Water | Tap | WC45 | 3.04 |
| C1/1-ÁGUA4 | Before action plan | 1 | Dessert | Water | Tap | WEC | <3 |
| C1/1-ÁGUA5 | Before action plan | 1 | Pre-preparation | Water | Tap | PS | 0 |
| C1/1-ÁGUA5 | Before action plan | 1 | Pre-preparation | Water | Tap | WC36 | <3 |
| C1/1-ÁGUA5 | Before action plan | 1 | Pre-preparation | Water | Tap | WC45 | <3 |
| C1/1-ÁGUA5 | Before action plan | 1 | Pre-preparation | Water | Tap | WEC | <3 |
| C1/1-MÃO1 | Before action plan | 1 | Kitchen | Hand | Worker 1 – before hand washing | AMC | 2.41 |
| C1/1-MÃO1 | Before action plan | 1 | Kitchen | Hand | Worker 1 – before hand washing | EC | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/1-MÃO1 | Before action plan | 1 | Kitchen | Hand | Worker 1 – before hand washing | CPS | 0 |
| C1/1-MÃO2 | Before action plan | 1 | Pre-preparation | Hand | Worker 2 – before hand washing | AMC | 1.71 |
| C1/1-MÃO2 | Before action plan | 1 | Pre-preparation | Hand | Worker 2 – before hand washing | EC | 0 |
| C1/1-MÃO2 | Before action plan | 1 | Pre-preparation | Hand | Worker 2 – before hand washing | CPS | 0 |
| C1/1-MÃO3 | Before action plan | 1 | Snacks | Hand | Worker 3 – before hand washing | AMC | 2.54 |
| C1/1-MÃO3 | Before action plan | 1 | Snacks | Hand | Worker 3 – before hand washing | EC | 0 |
| C1/1-MÃO4 | Before action plan | 1 | Butchery | Hand | Worker 4 – before hand washing | CPS | 0 |
| C1/1-MÃO5 | Before action plan | 1 | Dessert | Hand | Worker 5 – before hand washing | AMC | 3.05 |
| C1/1-MÃO5 | Before action plan | 1 | Dessert | Hand | Worker 5 – before hand washing | EC | 0 |
| C1/1-MÃO5 | Before action plan | 1 | Dessert | Hand | Worker 5 – before hand washing | CPS | 0 |
| C1/1-MÃO6 | Before action plan | 1 | Pre-preparation | Hand | Worker 1 – during shift | AMC | 3.30 |
| C1/1-MÃO6 | Before action plan | 1 | Pre-preparation | Hand | Worker 1 – during shift | EC | 0 |
| C1/1-MÃO6 | Before action plan | 1 | Pre-preparation | Hand | Worker 1 – during shift | CPS | 0 |
| C1/1-MÃO7 | Before action plan | 1 | Kitchen | Hand | Worker 2 – during shift | AMC | 1.72 |
| C1/1-MÃO7 | Before action plan | 1 | Kitchen | Hand | Worker 2 – during shift | EC | 0 |
| C1/1-MÃO7 | Before action plan | 1 | Kitchen | Hand | Worker 2 – during shift | CPS | 0 |
| C1/1-MÃO8 | Before action plan | 1 | Snacks | Hand | Worker 3 – during shift | AMC | 1.04 |
| C1/1-MÃO8 | Before action plan | 1 | Snacks | Hand | Worker 3 – during shift | EC | 0 |
| C1/1-MÃO8 | Before action plan | 1 | Snacks | Hand | Worker 3 – during shift | CPS | 0 |
| C1/1-MÃO9 | Before action plan | 1 | Butchery | Hand | Worker 4 – during shift | AMC | 3.21 |
| C1/1-MÃO9 | Before action plan | 1 | Butchery | Hand | Worker 4 – during shift | EC | 0 |
| C1/1-MÃO9 | Before action plan | 1 | Butchery | Hand | Worker 4 – during shift | CPS | 0 |
| C1/1-MÃO10 | Before action plan | 1 | Dessert | Hand | Worker 5 – during shift | AMC | 2.03 |
| C1/1-MÃO10 | Before action plan | 1 | Dessert | Hand | Worker 5 – during shift | EC | 0 |
| C1/1-MÃO10 | Before action plan | 1 | Dessert | Hand | Worker 5 – during shift | CPS | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C2/1-AL1 | Before action plan | 2 | Cold chamber | Food | B. Pre-prepared / prepared (Beans - raw, washed and chilled) | SS | 0 |
| C2/1-AL1 | Before action plan | 2 | Cold chamber | Food | B. Pre-prepared / prepared (Beans - raw, washed and chilled) | LM | 0 |
| C2/1-AL1 | Before action plan | 2 | Cold chamber | Food | B. Pre-prepared / prepared (Beans - raw, washed and chilled) | EC | 2.36 |
| C2/1-AL2 | Before action plan | 2 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | LM | 1 |
| C2/1-AL2 | Before action plan | 2 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | SS | 0 |
| C2/1-AL2 | Before action plan | 2 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | EC | <1.0 |
| C2/1-AL2 | Before action plan | 2 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | CPS | <1.0 |
| C2/1-AL3 | Before action plan | 2 | Snacks | Food | C. Prepared & ready-to-eat (Sliced pineapple) | SS | 0 |
| C2/1-AL3 | Before action plan | 2 | Snacks | Food | C. Prepared & ready-to-eat (Sliced pineapple) | LM | 0 |
| C2/1-AL3 | Before action plan | 2 | Snacks | Food | C. Prepared & ready-to-eat (Sliced pineapple) | EC | <1.0 |
| C2/1-AL4 | Before action plan | 2 | Pre-preparation | Food | C. Prepared & ready-to-eat (Sliced cabbage) | SS | 0 |
| C2/1-AL4 | Before action plan | 2 | Pre-preparation | Food | C. Prepared & ready-to-eat (Sliced cabbage) | LM | 0 |
| C2/1-AL4 | Before action plan | 2 | Pre-preparation | Food | C. Prepared & ready-to-eat (Sliced cabbage) | EC | <1.0 |
| C2/1-AL5 | Before action plan | 2 | Dessert | Food | D. Cooked (Coffee with milk) | SS | 0 |
| C2/1-AL5 | Before action plan | 2 | Dessert | Food | D. Cooked (Coffee with milk) | LM | 0 |
| C2/1-AL5 | Before action plan | 2 | Dessert | Food | D. Cooked (Coffee with milk) | EC | <1.0 |
| C2/1-AL6 | Before action plan | 2 | Kitchen | Food | D. Cooked (Boiled beans) | SS | 0 |
| C2/1-AL6 | Before action plan | 2 | Kitchen | Food | D. Cooked (Boiled beans) | LM | 0 |
| C2/1-AL6 | Before action plan | 2 | Kitchen | Food | D. Cooked (Boiled beans) | EC | <1.0 |
| C2/1-AL7 | Before action plan | 2 | Kitchen | Food | D. Cooked (Shredded cooked chicken) | SS | 0 |
| C2/1-AL7 | Before action plan | 2 | Kitchen | Food | D. Cooked (Shredded cooked chicken) | LM | 0 |
| C2/1-AL7 | Before action plan | 2 | Kitchen | Food | D. Cooked (Shredded cooked chicken) | AMC | 2.17 |
| C2/1-AL7 | Before action plan | 2 | Kitchen | Food | D. Cooked (Shredded cooked chicken) | EC | <1.0 |
| C2/1-ÁGUA1 | Before action plan | 2 | Washing area | Water | Tap | PS | 0 |
| C2/1-ÁGUA1 | Before action plan | 2 | Washing area | Water | Tap | WC36 | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C2/1-ÁGUA1 | Before action plan | 2 | Washing area | Water | Tap | WC45 | <3 |
| C2/1-ÁGUA1 | Before action plan | 2 | Washing area | Water | Tap | WEC | <3 |
| C2/1-ÁGUA2 | Before action plan | 2 | Pre-preparation | Water | Filter | EN | 0 |
| C2/1-ÁGUA2 | Before action plan | 2 | Pre-preparation | Water | Filter | PS | 0 |
| C2/1-ÁGUA2 | Before action plan | 2 | Pre-preparation | Water | Filter | WC36 | 1.63 |
| C2/1-ÁGUA2 | Before action plan | 2 | Pre-preparation | Water | Filter | WC45 | 1.63 |
| C2/1-ÁGUA2 | Before action plan | 2 | Pre-preparation | Water | Filter | WEC | <3 |
| C2/1-ÁGUA3 | Before action plan | 2 | Butchery | Water | Tap | PS | 0 |
| C2/1-ÁGUA3 | Before action plan | 2 | Butchery | Water | Tap | WC36 | <3 |
| C2/1-ÁGUA3 | Before action plan | 2 | Butchery | Water | Tap | WC45 | <3 |
| C2/1-ÁGUA3 | Before action plan | 2 | Butchery | Water | Tap | WEC | <3 |
| C2/1-ÁGUA4 | Before action plan | 2 | Dessert | Water | Filter | EN | 0 |
| C2/1-ÁGUA4 | Before action plan | 2 | Dessert | Water | Filter | PS | 0 |
| C2/1-ÁGUA4 | Before action plan | 2 | Dessert | Water | Filter | WC36 | <3 |
| C2/1-ÁGUA4 | Before action plan | 2 | Dessert | Water | Filter | WC45 | <3 |
| C2/1-ÁGUA4 | Before action plan | 2 | Dessert | Water | Filter | WEC | <3 |
| C2/1-ÁGUA5 | Before action plan | 2 | Pre-preparation | Water | Tap | PS | 0 |
| C2/1-ÁGUA5 | Before action plan | 2 | Pre-preparation | Water | Tap | WC36 | <3 |
| C2/1-ÁGUA5 | Before action plan | 2 | Pre-preparation | Water | Tap | WC45 | <3 |
| C2/1-ÁGUA5 | Before action plan | 2 | Pre-preparation | Water | Tap | WEC | <3 |
| C2/1-MÃO1 | Before action plan | 2 | Kitchen | Hand | Worker 1- before washing | AMC | 1.55 |
| C2/1-MÃO1 | Before action plan | 2 | Kitchen | Hand | Worker 1- before washing | EC | 0 |
| C2/1-MÃO1 | Before action plan | 2 | Kitchen | Hand | Worker 1- before washing | CPS | 0 |
| C2/1-MÃO2 | Before action plan | 2 | Snacks | Hand | Worker 2- before washing | AMC | 0.90 |
| C2/1-MÃO2 | Before action plan | 2 | Snacks | Hand | Worker 2- before washing | EC | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C2/1-MÃO2 | Before action plan | 2 | Snacks | Hand | Worker 2- before washing | CPS | 0 |
| C2/1-MÃO4 | Before action plan | 2 | Dessert | Hand | Worker 4- before washing | AMC | 1.14 |
| C2/1-MÃO4 | Before action plan | 2 | Dessert | Hand | Worker 4- before washing | EC | 0 |
| C2/1-MÃO4 | Before action plan | 2 | Dessert | Hand | Worker 4- before washing | CPS | 0 |
| C2/1-MÃO5 | Before action plan | 2 | Pre-preparation | Hand | Worker 5- before washing | AMC | 1.54 |
| C2/1-MÃO5 | Before action plan | 2 | Pre-preparation | Hand | Worker 5- before washing | EC | 0 |
| C2/1-MÃO5 | Before action plan | 2 | Pre-preparation | Hand | Worker 5- before washing | CPS | 0 |
| C2/1-MÃO6 | Before action plan | 2 | Kitchen | Hand | Worker 1- during shift | AMC | 3.11 |
| C2/1-MÃO6 | Before action plan | 2 | Kitchen | Hand | Worker 1- during shift | EC | 0 |
| C2/1-MÃO6 | Before action plan | 2 | Kitchen | Hand | Worker 1- during shift | CPS | 0 |
| C2/1-MÃO7 | Before action plan | 2 | Snacks | Hand | Worker 2- during shift | AMC | 2.19 |
| C2/1-MÃO7 | Before action plan | 2 | Snacks | Hand | Worker 2- during shift | EC | 0 |
| C2/1-MÃO7 | Before action plan | 2 | Snacks | Hand | Worker 2- during shift | CPS | 0 |
| C2/1-MÃO9 | Before action plan | 2 | Dessert | Hand | Worker 4- during shift | AMC | 0.60 |
| C2/1-MÃO9 | Before action plan | 2 | Dessert | Hand | Worker 4- during shift | EC | 0 |
| C2/1-MÃO9 | Before action plan | 2 | Dessert | Hand | Worker 4- during shift | CPS | 0 |
| C2/1-MÃO10 | Before action plan | 2 | Pre-preparation | Hand | Worker 5- during shift | AMC | 1.20 |
| C2/1-MÃO10 | Before action plan | 2 | Pre-preparation | Hand | Worker 5- during shift | EC | 0 |
| C2/1-MÃO10 | Before action plan | 2 | Pre-preparation | Hand | Worker 5- during shift | CPS | 0 |
| C3/1-AL1 | Before action plan | 3 | Kitchen | Food | D. Cooked (Soup with salt) | SS | 0 |
| C3/1-AL1 | Before action plan | 3 | Kitchen | Food | D. Cooked (Soup with salt) | LM | 0 |
| C3/1-AL1 | Before action plan | 3 | Kitchen | Food | D. Cooked (Soup with salt) | EC | <1.0 |
| C3/1-AL1 | Before action plan | 3 | Kitchen | Food | D. Cooked (Soup with salt) | YM | 0 |
| C3/1-AL2 | Before action plan | 3 | Snacks | Food | E. Ready-to-eat (Bread with butter) | SS | 0 |
| C3/1-AL2 | Before action plan | 3 | Snacks | Food | E. Ready-to-eat (Bread with butter) | LM | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/1-AL2 | Before action plan | 3 | Snacks | Food | E. Ready-to-eat (Bread with butter) | EC | <1.0 |
| C3/1-AL2 | Before action plan | 3 | Snacks | Food | E. Ready-to-eat (Bread with butter) | CPS | <1.0 |
| C3/1-AL2 | Before action plan | 3 | Snacks | Food | E. Ready-to-eat (Bread with butter) | BC | <1.0 |
| C3/1-AL2 | Before action plan | 3 | Snacks | Food | E. Ready-to-eat (Bread with butter) | YM | 0.30 |
| C3/1-AL3 | Before action plan | 3 | Butchery | Food | B. Pre-prepared / prepared (Raw beef strips) | SS | 0 |
| C3/1-AL3 | Before action plan | 3 | Butchery | Food | B. Pre-prepared / prepared (Raw beef strips) | LM | 1 |
| C3/1-AL3 | Before action plan | 3 | Butchery | Food | B. Pre-prepared / prepared (Raw beef strips) | AMC | 5.53 |
| C3/1-AL3 | Before action plan | 3 | Butchery | Food | B. Pre-prepared / prepared (Raw beef strips) | EC | <1.0 |
| C3/1-AL4 | Before action plan | 3 | Butchery | Food | D. Cooked (Cooked beef strips) | SS | 0 |
| C3/1-AL4 | Before action plan | 3 | Butchery | Food | D. Cooked (Cooked beef strips) | LM | 0 |
| C3/1-AL4 | Before action plan | 3 | Butchery | Food | D. Cooked (Cooked beef strips) | EC | <1.0 |
| C3/1-AL4 | Before action plan | 3 | Butchery | Food | D. Cooked (Cooked beef strips) | CPS | <1.0 |
| C3/1-AL5 | Before action plan | 3 | Dessert | Food | D. Cooked (Pudding) | SS | 0 |
| C3/1-AL5 | Before action plan | 3 | Dessert | Food | D. Cooked (Pudding) | LM | 0 |
| C3/1-AL5 | Before action plan | 3 | Dessert | Food | D. Cooked (Pudding) | EC | <1.0 |
| C3/1-AL5 | Before action plan | 3 | Dessert | Food | D. Cooked (Pudding) | CPS | <1.0 |
| C3/1-AL5 | Before action plan | 3 | Dessert | Food | D. Cooked (Pudding) | BC | <1.0 |
| C3/1-AL6 | Before action plan | 3 | Pre-preparation | Food | B. Pre-prepared / prepared (Peeled and sliced raw pumpkin) | SS | 0 |
| C3/1-AL6 | Before action plan | 3 | Pre-preparation | Food | B. Pre-prepared / prepared (Peeled and sliced raw pumpkin) | LM | 0 |
| C3/1-AL6 | Before action plan | 3 | Pre-preparation | Food | B. Pre-prepared / prepared (Peeled and sliced raw pumpkin) | EC | <1.0 |
| C3/1-AL7 | Before action plan | 3 | Kitchen | Food | D. Cooked (Seasoned roasted pumpkin) | SS | 0 |
| C3/1-AL7 | Before action plan | 3 | Kitchen | Food | D. Cooked (Seasoned roasted pumpkin) | LM | 0 |
| C3/1-AL7 | Before action plan | 3 | Kitchen | Food | D. Cooked (Seasoned roasted pumpkin) | EC | <1.0 |
| C3/1-ÁGUA2 | Before action plan | 3 | Snacks | Water | Tap | PS | 0 |
| C3/1-ÁGUA2 | Before action plan | 3 | Snacks | Water | Tap | WC36 | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/1-ÁGUA2 | Before action plan | 3 | Snacks | Water | Tap | WC45 | <3 |
| C3/1-ÁGUA2 | Before action plan | 3 | Snacks | Water | Tap | WEC | <3 |
| C3/1-ÁGUA3 | Before action plan | 3 | Washing area | Water | Tap | PS | 0 |
| C3/1-ÁGUA3 | Before action plan | 3 | Washing area | Water | Tap | WC36 | 3.04 |
| C3/1-ÁGUA3 | Before action plan | 3 | Washing area | Water | Tap | WC45 | 3.04 |
| C3/1-ÁGUA3 | Before action plan | 3 | Washing area | Water | Tap | WEC | <3 |
| C3/1-ÁGUA4 | Before action plan | 3 | Dessert | Water | Filter | EN | 0 |
| C3/1-ÁGUA4 | Before action plan | 3 | Dessert | Water | Filter | PS | 0 |
| C3/1-ÁGUA4 | Before action plan | 3 | Dessert | Water | Filter | WC36 | <3 |
| C3/1-ÁGUA4 | Before action plan | 3 | Dessert | Water | Filter | WC45 | <3 |
| C3/1-ÁGUA4 | Before action plan | 3 | Dessert | Water | Filter | WEC | <3 |
| C3/1-ÁGUA5 | Before action plan | 3 | Pre-preparation | Water | Tap | PS | 0 |
| C3/1-ÁGUA5 | Before action plan | 3 | Pre-preparation | Water | Tap | WC36 | <3 |
| C3/1-ÁGUA5 | Before action plan | 3 | Pre-preparation | Water | Tap | WC45 | <3 |
| C3/1-ÁGUA5 | Before action plan | 3 | Pre-preparation | Water | Tap | WEC | <3 |
| C3/1-AR1 | Before action plan | 3 | Distribution | Air | Over the counter with sink | YM | 0 |
| C3/1-AR1 | Before action plan | 3 | Snacks | Air | On top of the thermal counter | YM | 2.32 |
| C3/1-AR1 | Before action plan | 3 | Butchery | Air | Over the counter with sink | YM | 2.28 |
| C3/1-AR1 | Before action plan | 3 | Dessert | Air | Between the oven and the hood | YM | 2.34 |
| C3/1-AR1 | Before action plan | 3 | Pre-preparation | Air | Counter in front the ventilation | YM | 2.29 |
| C3/1-AR1 | Before action plan | 3 | Kitchen | Air | Over the counter with sink | YM | 2.35 |
| C3/1-AR1 | Before action plan | 3 | Kitchen | Air | Over the counter of dietetic meals area | YM | 2.33 |
| C3/1-AR1 | Before action plan | 3 | Pan storage | Air | Pots and pans shelf | YM | 2.33 |
| C3/1-AR1 | Before action plan | 3 | Kitchen | Air | Oven area | YM | 2.29 |
| C3/1-AR1 | Before action plan | 3 | Cold storage | Air | Frozen products | YM | 1.56 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/1-AR1 | Before action plan | 3 | Cold storage | Air | Chilled products | YM | 1.41 |
| C3/1-AR1 | Before action plan | 3 | Cold storage | Air | Eggs and vegetables | YM | 1.61 |
| C3/1-AR1 | Before action plan | 3 | Cold storage | Air | Prepared foods | YM | 1.64 |
| C3/1-AR1 | Before action plan | 3 | Dry food storage | Air | Corridor | YM | 2.07 |
| C3/1-AR1 | Before action plan | 3 | Receiving area | Air | Over the counter with sink | YM | 2.21 |
| C3/1-MÃO1 | Before action plan | 3 | Kitchen | Hand | Worker 1- before hand washing | AMC | 1.81 |
| C3/1-MÃO1 | Before action plan | 3 | Kitchen | Hand | Worker 1- before hand washing | EC | 0 |
| C3/1-MÃO1 | Before action plan | 3 | Kitchen | Hand | Worker 1- before hand washing | CPS | 0 |
| C3/1-MÃO2 | Before action plan | 3 | Pre-preparation | Hand | Worker 2- before hand washing | AMC | 3.17 |
| C3/1-MÃO2 | Before action plan | 3 | Pre-preparation | Hand | Worker 2- before hand washing | EC | 0 |
| C3/1-MÃO2 | Before action plan | 3 | Pre-preparation | Hand | Worker 2- before hand washing | CPS | 0 |
| C3/1-MÃO3 | Before action plan | 3 | Snacks | Hand | Worker 3- during shift | AMC | 2.49 |
| C3/1-MÃO3 | Before action plan | 3 | Snacks | Hand | Worker 3- during shift | EC | 0 |
| C3/1-MÃO3 | Before action plan | 3 | Snacks | Hand | Worker 3- during shift | CPS | 0 |
| C3/1-MÃO4 | Before action plan | 3 | Pre-preparation | Hand | Worker 4- before hand washing | AMC | 1.23 |
| C3/1-MÃO4 | Before action plan | 3 | Pre-preparation | Hand | Worker 4- before hand washing | EC | 0 |
| C3/1-MÃO4 | Before action plan | 3 | Pre-preparation | Hand | Worker 4- before hand washing | CPS | 0 |
| C3/1-MÃO5 | Before action plan | 3 | Kitchen | Hand | Worker 1- during shift | AMC | 3.89 |
| C3/1-MÃO5 | Before action plan | 3 | Kitchen | Hand | Worker 1- during shift | EC | 0 |
| C3/1-MÃO5 | Before action plan | 3 | Kitchen | Hand | Worker 1- during shift | CPS | 0 |
| C3/1-MÃO6 | Before action plan | 3 | Pre-preparation | Hand | Worker 4- during shift | AMC | 3.24 |
| C3/1-MÃO6 | Before action plan | 3 | Pre-preparation | Hand | Worker 4- during shift | EC | 0 |
| C3/1-MÃO6 | Before action plan | 3 | Pre-preparation | Hand | Worker 4- during shift | CPS | 0 |
| C3/1-MÃO7 | Before action plan | 3 | Snacks | Hand | Worker 3- before hand washing | AMC | 1.20 |
| C3/1-MÃO7 | Before action plan | 3 | Snacks | Hand | Worker 3- before hand washing | EC | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/1-MÃO7 | Before action plan | 3 | Snacks | Hand | Worker 3- before hand washing | CPS | 0 |
| C3/1-MÃO8 | Before action plan | 3 | Pre-preparation | Hand | Worker 2- during shift | AMC | 2.98 |
| C3/1-MÃO8 | Before action plan | 3 | Pre-preparation | Hand | Worker 2- during shift | EC | 0 |
| C3/1-MÃO8 | Before action plan | 3 | Pre-preparation | Hand | Worker 2- during shift | CPS | 0 |
| C4/1-AL1 | Before action plan | 4 | Kitchen | Food | D. Cooked (Zucchini without salt with condiments) | SS | 0 |
| C4/1-AL1 | Before action plan | 4 | Kitchen | Food | D. Cooked (Zucchini without salt with condiments) | LM | 0 |
| C4/1-AL1 | Before action plan | 4 | Kitchen | Food | D. Cooked (Zucchini without salt with condiments) | EC | <1.0 |
| C4/1-AL2 | Before action plan | 4 | Cold chamber | Food | C. Prepared & ready-to-eat (Sliced mozzarella cheese) | SS | 0 |
| C4/1-AL2 | Before action plan | 4 | Cold chamber | Food | C. Prepared & ready-to-eat (Sliced mozzarella cheese) | LM | 0 |
| C4/1-AL2 | Before action plan | 4 | Cold chamber | Food | C. Prepared & ready-to-eat (Sliced mozzarella cheese) | AMC | 4.31 |
| C4/1-AL2 | Before action plan | 4 | Cold chamber | Food | C. Prepared & ready-to-eat (Sliced mozzarella cheese) | EC | <1.0 |
| C4/1-AL2 | Before action plan | 4 | Cold chamber | Food | C. Prepared & ready-to-eat (Sliced mozzarella cheese) | CPS | <1.0 |
| C4/1-AL3 | Before action plan | 4 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | LM | 0 |
| C4/1-AL3 | Before action plan | 4 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | SS | 0 |
| C4/1-AL3 | Before action plan | 4 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | AMC | 5.46 |
| C4/1-AL3 | Before action plan | 4 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | EC | <1.0 |
| C4/1-AL3 | Before action plan | 4 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | CPS | <1.0 |
| C4/1-AL4 | Before action plan | 4 | Kitchen | Food | D. Cooked (Kung Pao Chicken) | SS | 0 |
| C4/1-AL4 | Before action plan | 4 | Kitchen | Food | D. Cooked (Kung Pao Chicken) | LM | 0 |
| C4/1-AL4 | Before action plan | 4 | Kitchen | Food | D. Cooked (Kung Pao Chicken) | AMC | 2 |
| C4/1-AL4 | Before action plan | 4 | Kitchen | Food | D. Cooked (Kung Pao Chicken) | EC | <1.0 |
| C4/1-AL4 | Before action plan | 4 | Kitchen | Food | D. Cooked (Kung Pao Chicken) | CPS | <1.0 |
| C4/1-AL5 | Before action plan | 4 | Dessert | Food | D. Cooked (Gelatin) | SS | 0 |
| C4/1-AL5 | Before action plan | 4 | Dessert | Food | D. Cooked (Gelatin) | LM | 0 |
| C4/1-AL5 | Before action plan | 4 | Dessert | Food | D. Cooked (Gelatin) | BC | <1.0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C4/1-AL5 | Before action plan | 4 | Dessert | Food | D. Cooked (Gelatin) | EC | <1.0 |
| C4/1-AL6 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Sliced and cooked beetroot) | SS | 0 |
| C4/1-AL6 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Sliced and cooked beetroot) | LM | 0 |
| C4/1-AL6 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Sliced and cooked beetroot) | EC | <1.0 |
| C4/1-AL6 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Sliced and cooked beetroot) | CPS | <1.0 |
| C4/1-AL7 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Chopped and cooked beetroot) | SS | 0 |
| C4/1-AL7 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Chopped and cooked beetroot) | LM | 0 |
| C4/1-AL7 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Chopped and cooked beetroot) | EC | <1.0 |
| C4/1-AL7 | Before action plan | 4 | Pre-preparation | Food | D. Cooked (Chopped and cooked beetroot) | CPS | <1.0 |
| C4/1-ÁGUA1 | Before action plan | 4 | Washing area | Water | Tap | PS | 0 |
| C4/1-ÁGUA1 | Before action plan | 4 | Washing area | Water | Tap | WC36 | <3 |
| C4/1-ÁGUA1 | Before action plan | 4 | Washing area | Water | Tap | WC45 | <3 |
| C4/1-ÁGUA1 | Before action plan | 4 | Washing area | Water | Tap | WEC | <3 |
| C4/1-ÁGUA2 | Before action plan | 4 | Snacks | Water | Tap | PS | 0 |
| C4/1-ÁGUA2 | Before action plan | 4 | Snacks | Water | Tap | WC36 | <3 |
| C4/1-ÁGUA2 | Before action plan | 4 | Snacks | Water | Tap | WC45 | <3 |
| C4/1-ÁGUA2 | Before action plan | 4 | Snacks | Water | Tap | WEC | <3 |
| C4/1-ÁGUA3 | Before action plan | 4 | Butchery | Water | Tap | PS | 0 |
| C4/1-ÁGUA3 | Before action plan | 4 | Butchery | Water | Tap | WC36 | <3 |
| C4/1-ÁGUA3 | Before action plan | 4 | Butchery | Water | Tap | WC45 | <3 |
| C4/1-ÁGUA3 | Before action plan | 4 | Butchery | Water | Tap | WEC | <3 |
| C4/1-ÁGUA4 | Before action plan | 4 | Dessert | Water | Filter | EN | 0 |
| C4/1-ÁGUA4 | Before action plan | 4 | Dessert | Water | Filter | PS | 0 |
| C4/1-ÁGUA4 | Before action plan | 4 | Dessert | Water | Filter | WC36 | <3 |
| C4/1-ÁGUA4 | Before action plan | 4 | Dessert | Water | Filter | WC45 | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C4/1-ÁGUA4 | Before action plan | 4 | Dessert | Water | Filter | WEC | <3 |
| C4/1-ÁGUA5 | Before action plan | 4 | Pre-preparation | Water | Filter | EN | 0 |
| C4/1-ÁGUA5 | Before action plan | 4 | Pre-preparation | Water | Filter | PS | 0 |
| C4/1-ÁGUA5 | Before action plan | 4 | Pre-preparation | Water | Filter | WC36 | <3 |
| C4/1-ÁGUA5 | Before action plan | 4 | Pre-preparation | Water | Filter | WC45 | <3 |
| C4/1-ÁGUA5 | Before action plan | 4 | Pre-preparation | Water | Filter | WEC | <3 |
| C4/1-AR2 | Before action plan | 4 | Kitchen | Air | Dry goods shelf | YM | 2.22 |
| C4/1-AR2 | Before action plan | 4 | Snacks | Air | On top of the thermal counter | YM | 2.24 |
| C4/1-AR2 | Before action plan | 4 | Butchery | Air | Over the counter | YM | 2.26 |
| C4/1-AR2 | Before action plan | 4 | Dessert | Air | Over the counter | YM | 1.66 |
| C4/1-AR2 | Before action plan | 4 | Pre-preparation | Air | Bread shelf | YM | 2.20 |
| C4/1-AR2 | Before action plan | 4 | Cold storage | Air | Eggs and vegetables | YM | 1.40 |
| C4/1-AR2 | Before action plan | 4 | Cold storage | Air | Prepared food | YM | 0 |
| C4/1-AR2 | Before action plan | 4 | Cold storage | Air | Frozen products | YM | 1.59 |
| C4/1-AR2 | Before action plan | 4 | Cold storage | Air | Chilled products | YM | 1.69 |
| C4/1-AR2 | Before action plan | 4 | Cold storage | Air | Corridor | YM | 2.06 |
| C4/1-AR2 | Before action plan | 4 | Receiving area | Air | Over the counter with sink | YM | 2.31 |
| C4/1-AR2 | Before action plan | 4 | Distribution | Air | On top of the packaging counter | YM | 1.97 |
| C4/1-AR2 | Before action plan | 4 | Pan storage | Air | Pots and pans shelf | YM | 2.34 |
| C4/1-MÃO1 | Before action plan | 4 | Kitchen | Hand | Worker 1- berofre hand washing | AMC | 5.08 |
| C4/1-MÃO1 | Before action plan | 4 | Kitchen | Hand | Worker 1- berofre hand washing | EC | 0 |
| C4/1-MÃO1 | Before action plan | 4 | Kitchen | Hand | Worker 1- berofre hand washing | CPS | 0.90 |
| C4/1-MÃO3 | Before action plan | 4 | Butchery | Hand | Worker 3- berofre hand washing | AMC | 3.57 |
| C4/1-MÃO3 | Before action plan | 4 | Butchery | Hand | Worker 3- berofre hand washing | EC | 0 |
| C4/1-MÃO3 | Before action plan | 4 | Butchery | Hand | Worker 3- berofre hand washing | CPS | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C4/1-MÃO5 | Before action plan | 4 | Pre-preparation | Hand | Worker 5- berofre hand washing | AMC | 1.83 |
| C4/1-MÃO5 | Before action plan | 4 | Pre-preparation | Hand | Worker 5- berofre hand washing | EC | 0 |
| C4/1-MÃO5 | Before action plan | 4 | Pre-preparation | Hand | Worker 5- berofre hand washing | CPS | 0 |
| C4/1-MÃO6 | Before action plan | 4 | Kitchen | Hand | Worker 1- during shift | AMC | 3.60 |
| C4/1-MÃO6 | Before action plan | 4 | Kitchen | Hand | Worker 1- during shift | EC | 0 |
| C4/1-MÃO6 | Before action plan | 4 | Kitchen | Hand | Worker 1- during shift | CPS | 0 |
| C4/1-MÃO8 | Before action plan | 4 | Butchery | Hand | Worker 3- during shift | AMC | 4.05 |
| C4/1-MÃO8 | Before action plan | 4 | Butchery | Hand | Worker 3- during shift | EC | 0 |
| C4/1-MÃO8 | Before action plan | 4 | Butchery | Hand | Worker 3- during shift | CPS | 0 |
| C4/1-MÃO10 | Before action plan | 4 | Pre-preparation | Hand | Worker 5- during shift | AMC | 2.09 |
| C4/1-MÃO10 | Before action plan | 4 | Pre-preparation | Hand | Worker 5- during shift | EC | 0 |
| C4/1-MÃO10 | Before action plan | 4 | Pre-preparation | Hand | Worker 5- during shift | CPS | 0.60 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/2-AL1 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw sliced shank) | EC | <1.0 |
| C1/2-AL1 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw sliced shank) | SS | 0 |
| C1/2-AL1 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw sliced shank) | LM | 0 |
| C1/2-AL2 | After action plan | 1 | Kitchen | Food | B. Pre-prepared / prepared (Raw sliced shank) | EC | 0 |
| C1/2-AL2 | After action plan | 1 | Kitchen | Food | D. Cooked (Roast shank) | CPS | 0 |
| C1/2-AL2 | After action plan | 1 | Kitchen | Food | D. Cooked (Roast shank) | CSR | 0 |
| C1/2-AL2 | After action plan | 1 | Kitchen | Food | D. Cooked (Roast shank) | SS | 0 |
| C1/2-AL2 | After action plan | 1 | Kitchen | Food | D. Cooked (Roast shank) | LM | 0 |
| C1/2-AL3 | After action plan | 1 | Kitchen | Food | D. Cooked (Boiled rice with salt) | EC | <1.0 |
| C1/2-AL3 | After action plan | 1 | Kitchen | Food | D. Cooked (Boiled rice with salt) | BC | <1.0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/2-AL3 | After action plan | 1 | Kitchen | Food | D. Cooked (Boiled rice with salt) | CPS | <1.0 |
| C1/2-AL3 | After action plan | 1 | Kitchen | Food | D. Cooked (Boiled rice with salt) | SS | 0 |
| C1/2-AL3 | After action plan | 1 | Kitchen | Food | D. Cooked (Boiled rice with salt) | LM | 0 |
| C1/2-AL4 | After action plan | 1 | Dessert | Food | D. Cooked (Curau- corn, milk and cinnamon) | EC | <1.0 |
| C1/2-AL4 | After action plan | 1 | Dessert | Food | D. Cooked (Curau- corn, milk and cinnamon) | CPS | <1.0 |
| C1/2-AL4 | After action plan | 1 | Dessert | Food | D. Cooked (Curau- corn, milk and cinnamon) | SS | 0 |
| C1/2-AL4 | After action plan | 1 | Dessert | Food | D. Cooked (Curau- corn, milk and cinnamon) | LM | 0 |
| C1/2-AL5 | After action plan | 1 | Pre-preparation | Food | B. Pre-prepared / prepared (Lettuce- washed and sanitized) | EC | <1.0 |
| C1/2-AL5 | After action plan | 1 | Pre-preparation | Food | B. Pre-prepared / prepared (Lettuce- washed and sanitized) | SS | 0 |
| C1/2-AL5 | After action plan | 1 | Pre-preparation | Food | B. Pre-prepared / prepared (Lettuce- washed and sanitized) | LM | 0 |
| C1/2-AL6 | After action plan | 1 | Cold chamber | Food | C. Prepared and ready-to-eat (Sliced mozzarella cheese) | EC | <1.0 |
| C1/2-AL6 | After action plan | 1 | Cold chamber | Food | C. Prepared and ready-to-eat (Sliced mozzarella cheese) | CPS | <1.0 |
| C1/2-AL6 | After action plan | 1 | Cold chamber | Food | C. Prepared and ready-to-eat (Sliced mozzarella cheese) | SS | 0 |
| C1/2-AL6 | After action plan | 1 | Cold chamber | Food | C. Prepared and ready-to-eat (Sliced mozzarella cheese) | LM | 0 |
| C1/2-AL7 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | EC | 6.09 |
| C1/2-AL7 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | CPS | <1.0 |
| C1/2-AL7 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | SS | 0 |
| C1/2-AL7 | After action plan | 1 | Butchery | Food | B. Pre-prepared / prepared (Raw ground meat) | LM | 0 |
| C1/2-ÁGUA1 | After action plan | 1 | Snacks | Water | Tap | PS | 0 |
| C1/2-ÁGUA1 | After action plan | 1 | Snacks | Water | Tap | WC36 | <3 |
| C1/2-ÁGUA1 | After action plan | 1 | Snacks | Water | Tap | WC45 | <3 |
| C1/2-ÁGUA1 | After action plan | 1 | Snacks | Water | Tap | WEC | <3 |
| C1/2-ÁGUA2 | After action plan | 1 | Kitchen | Water | Tap | PS | 0 |
| C1/2-ÁGUA2 | After action plan | 1 | Kitchen | Water | Tap | WC36 | <3 |
| C1/2-ÁGUA2 | After action plan | 1 | Kitchen | Water | Tap | WC45 | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/2-ÁGUA2 | After action plan | 1 | Kitchen | Water | Tap | WEC | <3 |
| C1/2-ÁGUA3 | After action plan | 1 | Pre-preparation | Water | Filter | EN | 0 |
| C1/2-ÁGUA3 | After action plan | 1 | Pre-preparation | Water | Filter | PS | 0 |
| C1/2-ÁGUA3 | After action plan | 1 | Pre-preparation | Water | Filter | WC36 | <3 |
| C1/2-ÁGUA3 | After action plan | 1 | Pre-preparation | Water | Filter | WC45 | <3 |
| C1/2-ÁGUA3 | After action plan | 1 | Pre-preparation | Water | Filter | WEC | <3 |
| C1/2-ÁGUA4 | After action plan | 1 | Dessert | Water | Filter | EN | 0 |
| C1/2-ÁGUA4 | After action plan | 1 | Dessert | Water | Filter | PS | 0 |
| C1/2-ÁGUA4 | After action plan | 1 | Dessert | Water | Filter | WC36 | <3 |
| C1/2-ÁGUA4 | After action plan | 1 | Dessert | Water | Filter | WC45 | <3 |
| C1/2-ÁGUA4 | After action plan | 1 | Dessert | Water | Filter | WEC | <3 |
| C1/2-ÁGUA5 | After action plan | 1 | Butchery | Water | Tap | PS | 0 |
| C1/2-ÁGUA5 | After action plan | 1 | Butchery | Water | Tap | WC36 | <3 |
| C1/2-ÁGUA5 | After action plan | 1 | Butchery | Water | Tap | WC45 | <3 |
| C1/2-ÁGUA5 | After action plan | 1 | Butchery | Water | Tap | WEC | <3 |
| C1/2-AR1 | After action plan | 1 | Receiving area | Air | Over the counter with sink | YM | 2.38 |
| C1/2-AR1 | After action plan | 1 | Dessert | Air | Between the oven and the hood | YM | 0.30 |
| C1/2-AR1 | After action plan | 1 | Dry food storage | Air | Corridor | YM | 1.38 |
| C1/2-AR1 | After action plan | 1 | Cold storage | Air | Prepared food | YM | 1.53 |
| C1/2-AR1 | After action plan | 1 | Pan storage | Air | Pots and pans shelf | YM | 1.38 |
| C1/2-AR1 | After action plan | 1 | Dessert | Air | Between the oven and the hood | YM | 1.08 |
| C1/2-AR1 | After action plan | 1 | Snacks | Air | On top of the thermal counter | YM | 0.85 |
| C1/2-AR1 | After action plan | 1 | Kitchen | Air | Oven area | YM | 1.45 |
| C1/2-AR1 | After action plan | 1 | Butchery | Air | Over the counter with sink | YM | 0.48 |
| C1/2-AR1 | After action plan | 1 | Pre-preparation | Air | Counter in front the ventilation | YM | 0.95 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/2-MÃO1 | After action plan | 1 | Kitchen | Hand | Worker 1- before hand washing | AMC | 3.51 |
| C1/2-MÃO1 | After action plan | 1 | Kitchen | Hand | Worker 1- before hand washing | EC | 0 |
| C1/2-MÃO1 | After action plan | 1 | Kitchen | Hand | Worker 1- before hand washing | CPS | 0 |
| C1/2-MÃO2 | After action plan | 1 | Kitchen | Hand | Worker 1- after hand washing | AMC | 2.08 |
| C1/2-MÃO2 | After action plan | 1 | Kitchen | Hand | Worker 1- after hand washing | EC | 0 |
| C1/2-MÃO2 | After action plan | 1 | Kitchen | Hand | Worker 1- after hand washing | CPS | 0 |
| C1/2-MÃO3 | After action plan | 1 | Kitchen | Hand | Worker 1- during shift | AMC | 3.33 |
| C1/2-MÃO3 | After action plan | 1 | Kitchen | Hand | Worker 1- during shift | EC | 0 |
| C1/2-MÃO3 | After action plan | 1 | Kitchen | Hand | Worker 1- during shift | CPS | 0 |
| C1/2-MÃO4 | After action plan | 1 | Pre-preparation | Hand | Worker 2- before hand washing | AMC | 3.95 |
| C1/2-MÃO4 | After action plan | 1 | Pre-preparation | Hand | Worker 2- before hand washing | EC | 0 |
| C1/2-MÃO4 | After action plan | 1 | Pre-preparation | Hand | Worker 2- before hand washing | CPS | 0 |
| C1/2-MÃO5 | After action plan | 1 | Pre-preparation | Hand | Worker 2- after hand washing | AMC | 0.84 |
| C1/2-MÃO5 | After action plan | 1 | Pre-preparation | Hand | Worker 2- after hand washing | EC | 0 |
| C1/2-MÃO5 | After action plan | 1 | Pre-preparation | Hand | Worker 2- after hand washing | CPS | 0 |
| C1/2-MÃO6 | After action plan | 1 | Pre-preparation | Hand | Worker 2- during shift | AMC | 0.77 |
| C1/2-MÃO6 | After action plan | 1 | Pre-preparation | Hand | Worker 2- during shift | EC | 0 |
| C1/2-MÃO6 | After action plan | 1 | Pre-preparation | Hand | Worker 2- during shift | CPS | 0 |
| C1/2-MÃO8 | After action plan | 1 | Snacks | Hand | Worker 3- after hand washing | AMC | 0.30 |
| C1/2-MÃO8 | After action plan | 1 | Snacks | Hand | Worker 3- after hand washing | EC | 0 |
| C1/2-MÃO8 | After action plan | 1 | Snacks | Hand | Worker 3- after hand washing | CPS | 0 |
| C1/2-MÃO9 | After action plan | 1 | Snacks | Hand | Worker 3- during shift | AMC | 3.59 |
| C1/2-MÃO9 | After action plan | 1 | Snacks | Hand | Worker 3- during shift | EC | 0 |
| C1/2-MÃO9 | After action plan | 1 | Snacks | Hand | Worker 3- during shift | CPS | 0 |
| C1/2-MÃO10 | After action plan | 1 | Dessert | Hand | Worker 4- before hand washing | AMC | 3.29 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C1/2-MÃO10 | After action plan | 1 | Dessert | Hand | Worker 4- before hand washing | EC | 0 |
| C1/2-MÃO10 | After action plan | 1 | Dessert | Hand | Worker 4- before hand washing | CPS | 0 |
| C1/2-MÃO11 | After action plan | 1 | Dessert | Hand | Worker 4- after hand washing | AMC | 2.95 |
| C1/2-MÃO11 | After action plan | 1 | Dessert | Hand | Worker 4- after hand washing | EC | 0 |
| C1/2-MÃO11 | After action plan | 1 | Dessert | Hand | Worker 4- after hand washing | CPS | 0 |
| C1/2-MÃO12 | After action plan | 1 | Dessert | Hand | Worker 4- during shift | AMC | 3.55 |
| C1/2-MÃO12 | After action plan | 1 | Dessert | Hand | Worker 4- during shift | EC | 0 |
| C1/2-MÃO12 | After action plan | 1 | Dessert | Hand | Worker 4- during shift | CPS | 0 |
| C1/2-MÃO13 | After action plan | 1 | Butchery | Hand | Worker 5- before hand washing | AMC | 1.83 |
| C1/2-MÃO13 | After action plan | 1 | Butchery | Hand | Worker 5- before hand washing | EC | 0 |
| C1/2-MÃO13 | After action plan | 1 | Butchery | Hand | Worker 5- before hand washing | CPS | 0 |
| C1/2-MÃO14 | After action plan | 1 | Butchery | Hand | Worker 5- after hand washing | AMC | 1.20 |
| C1/2-MÃO14 | After action plan | 1 | Butchery | Hand | Worker 5- after hand washing | EC | 0 |
| C1/2-MÃO14 | After action plan | 1 | Butchery | Hand | Worker 5- after hand washing | CPS | 0 |
| C2/2-AL1 | After action plan | 2 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | SS | 0 |
| C2/2-AL1 | After action plan | 2 | Butchery | Food | B. Pre-prepared / prepared (Raw chicken strips) | LM | 0 |
| C2/2-AL2 | After action plan | 2 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped chard) | LM | 0 |
| C2/2-AL2 | After action plan | 2 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped chard) | SS | 0 |
| C2/2-AL2 | After action plan | 2 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped chard) | EC | <1.0 |
| C2/2-AL3 | After action plan | 2 | Distribution | Food | A. Raw material (Salt) | EC | <1.0 |
| C2/2-AL3 | After action plan | 2 | Distribution | Food | A. Raw material (Salt) | LM | 0 |
| C2/2-AL3 | After action plan | 2 | Distribution | Food | A. Raw material (Salt) | SS | 0 |
| C2/2-AL4 | After action plan | 2 | Dessert | Food | D. Cooked (Cooked sago) | EC | <1.0 |
| C2/2-AL4 | After action plan | 2 | Dessert | Food | D. Cooked (Cooked sago) | BC | <1.0 |
| C2/2-AL4 | After action plan | 2 | Dessert | Food | D. Cooked (Cooked sago) | CPS | <1.0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C2/2-AL4 | After action plan | 2 | Dessert | Food | D. Cooked (Cooked sago) | LM | 0 |
| C2/2-AL4 | After action plan | 2 | Dessert | Food | D. Cooked (Cooked sago) | SS | 0 |
| C2/2-AL5 | After action plan | 2 | Kitchen | Food | D. Cooked (Cassoulet) | EC | <1.0 |
| C2/2-AL5 | After action plan | 2 | Kitchen | Food | D. Cooked (Cassoulet) | CSR | <1.0 |
| C2/2-AL5 | After action plan | 2 | Kitchen | Food | D. Cooked (Cassoulet) | CPS | <1.0 |
| C2/2-AL5 | After action plan | 2 | Kitchen | Food | D. Cooked (Cassoulet) | LM | 0 |
| C2/2-AL5 | After action plan | 2 | Kitchen | Food | D. Cooked (Cassoulet) | SS | 0 |
| C2/2-AL6 | After action plan | 2 | Butchery | Food | A. Raw material (Raw chicken breast) | EC | <1.0 |
| C2/2-AL6 | After action plan | 2 | Butchery | Food | A. Raw material (Raw chicken breast) | LM | 0 |
| C2/2-ÁGUA1 | After action plan | 2 | Pre-preparation | Water | Tap | PS | 0 |
| C2/2-ÁGUA1 | After action plan | 2 | Pre-preparation | Water | Tap | WC36 | <3 |
| C2/2-ÁGUA1 | After action plan | 2 | Pre-preparation | Water | Tap | WC45 | <3 |
| C2/2-ÁGUA1 | After action plan | 2 | Pre-preparation | Water | Tap | WEC | <3 |
| C2/2-ÁGUA2 | After action plan | 2 | Kitchen | Water | Tap | PS | 0 |
| C2/2-ÁGUA2 | After action plan | 2 | Kitchen | Water | Tap | WC36 | <3 |
| C2/2-ÁGUA2 | After action plan | 2 | Kitchen | Water | Tap | WC45 | <3 |
| C2/2-ÁGUA2 | After action plan | 2 | Kitchen | Water | Tap | WEC | <3 |
| C2/2-ÁGUA3 | After action plan | 2 | Dessert | Water | Tap | PS | 0 |
| C2/2-ÁGUA3 | After action plan | 2 | Dessert | Water | Tap | WC36 | <3 |
| C2/2-ÁGUA3 | After action plan | 2 | Dessert | Water | Tap | WC45 | <3 |
| C2/2-ÁGUA3 | After action plan | 2 | Dessert | Water | Tap | WEC | <3 |
| C2/2-ÁGUA4 | After action plan | 2 | Washing area | Water | Tap | PS | 0 |
| C2/2-ÁGUA4 | After action plan | 2 | Washing area | Water | Tap | WC36 | <3 |
| C2/2-ÁGUA4 | After action plan | 2 | Washing area | Water | Tap | WC45 | <3 |
| C2/2-ÁGUA4 | After action plan | 2 | Washing area | Water | Tap | WEC | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C2/2-ÁGUA5 | After action plan | 2 | Butchery | Water | Tap | PS | 0 |
| C2/2-ÁGUA5 | After action plan | 2 | Butchery | Water | Tap | WC36 | 1.63 |
| C2/2-ÁGUA5 | After action plan | 2 | Butchery | Water | Tap | WC45 | <3 |
| C2/2-ÁGUA5 | After action plan | 2 | Butchery | Water | Tap | WEC | <3 |
| C2/2-AR2 | After action plan | 2 | Cold storage | Air | Eggs and vegetables | YM | 1.08 |
| C2/2-AR2 | After action plan | 2 | Kitchen | Air | Dry goods shelf | YM | 1.40 |
| C2/2-AR2 | After action plan | 2 | Cold storage | Air | Prepared food | YM | 1.30 |
| C2/2-AR2 | After action plan | 2 | Cold storage | Air | Frozen products | YM | 0 |
| C2/2-AR2 | After action plan | 2 | Cold storage | Air | Chilled products | YM | 0 |
| C2/2-AR2 | After action plan | 2 | Receiving area | Air | Over the counter with sink | YM | 0.48 |
| C2/2-AR2 | After action plan | 2 | Dessert | Air | Over the counter | YM | 1.75 |
| C2/2-AR2 | After action plan | 2 | Pre-preparation | Air | Bread shelf | YM | 0.70 |
| C2/2-AR2 | After action plan | 2 | Distribution | Air | On top of the packaging counter | YM | 1.28 |
| C2/2-MÃO1 | After action plan | 2 | Kitchen | Hand | Worker 6- before hand washing | AMC | 2.90 |
| C2/2-MÃO1 | After action plan | 2 | Kitchen | Hand | Worker 6- before hand washing | EC | 0 |
| C2/2-MÃO1 | After action plan | 2 | Kitchen | Hand | Worker 6- before hand washing | CPS | 0 |
| C2/2-MÃO2 | After action plan | 2 | Kitchen | Hand | Worker 6- after hand washing | AMC | 2.44 |
| C2/2-MÃO2 | After action plan | 2 | Kitchen | Hand | Worker 6- after hand washing | EC | 0 |
| C2/2-MÃO2 | After action plan | 2 | Kitchen | Hand | Worker 6- after hand washing | CPS | 0 |
| C2/2-MÃO3 | After action plan | 2 | Kitchen | Hand | Worker 6- during shift | AMC | 2.53 |
| C2/2-MÃO3 | After action plan | 2 | Kitchen | Hand | Worker 6- during shift | EC | 0 |
| C2/2-MÃO3 | After action plan | 2 | Kitchen | Hand | Worker 6- during shift | CPS | 0 |
| C2/2-MÃO4 | After action plan | 2 | Pre-preparation | Hand | Worker 7- before hand washing | AMC | 2.16 |
| C2/2-MÃO4 | After action plan | 2 | Pre-preparation | Hand | Worker 7- before hand washing | EC | 0 |
| C2/2-MÃO4 | After action plan | 2 | Pre-preparation | Hand | Worker 7- before hand washing | CPS | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C2/2-MÃO5 | After action plan | 2 | Pre-preparation | Hand | Worker 7- after hand washing | AMC | 0.95 |
| C2/2-MÃO5 | After action plan | 2 | Pre-preparation | Hand | Worker 7- after hand washing | EC | 0 |
| C2/2-MÃO5 | After action plan | 2 | Pre-preparation | Hand | Worker 7- after hand washing | CPS | 0 |
| C2/2-MÃO6 | After action plan | 2 | Pre-preparation | Hand | Worker 7- during shift | AMC | 2.00 |
| C2/2-MÃO6 | After action plan | 2 | Pre-preparation | Hand | Worker 7- during shift | EC | 0 |
| C2/2-MÃO6 | After action plan | 2 | Pre-preparation | Hand | Worker 7- during shift | CPS | 0 |
| C2/2-MÃO7 | After action plan | 2 | Dessert | Hand | Worker 8- before hand washing | AMC | 3.09 |
| C2/2-MÃO7 | After action plan | 2 | Dessert | Hand | Worker 8- before hand washing | EC | 0 |
| C2/2-MÃO7 | After action plan | 2 | Dessert | Hand | Worker 8- before hand washing | CPS | 0 |
| C2/2-MÃO8 | After action plan | 2 | Dessert | Hand | Worker 8- after hand washing | AMC | 1.89 |
| C2/2-MÃO8 | After action plan | 2 | Dessert | Hand | Worker 8- after hand washing | EC | 0 |
| C2/2-MÃO8 | After action plan | 2 | Dessert | Hand | Worker 8- after hand washing | CPS | 0 |
| C2/2-MÃO9 | After action plan | 2 | Dessert | Hand | Worker 8- during shift | AMC | 3.69 |
| C2/2-MÃO9 | After action plan | 2 | Dessert | Hand | Worker 8- during shift | EC | 0 |
| C2/2-MÃO9 | After action plan | 2 | Dessert | Hand | Worker 8- during shift | CPS | 0 |
| C2/2-MÃO10 | After action plan | 2 | Butchery | Hand | Worker 9- before hand washing | AMC | 2.44 |
| C2/2-MÃO10 | After action plan | 2 | Butchery | Hand | Worker 9- before hand washing | EC | 0 |
| C2/2-MÃO10 | After action plan | 2 | Butchery | Hand | Worker 9- before hand washing | CPS | 0 |
| C2/2-MÃO11 | After action plan | 2 | Butchery | Hand | Worker 9- after hand washing | AMC | 1.04 |
| C2/2-MÃO11 | After action plan | 2 | Butchery | Hand | Worker 9- after hand washing | EC | 0 |
| C2/2-MÃO11 | After action plan | 2 | Butchery | Hand | Worker 9- after hand washing | CPS | 0 |
| C2/2-MÃO12 | After action plan | 2 | Butchery | Hand | Worker 9- during shift | AMC | 1.82 |
| C2/2-MÃO12 | After action plan | 2 | Butchery | Hand | Worker 9- during shift | EC | 0 |
| C2/2-MÃO12 | After action plan | 2 | Butchery | Hand | Worker 9- during shift | CPS | 0 |
| C3/2-AL1 | After action plan | 3 | Butchery | Food | A. Raw material (Raw chicken breast) | EC | <1.0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/2-AL1 | After action plan | 3 | Butchery | Food | A. Raw material (Raw chicken breast) | AMC | 3.65 |
| C3/2-AL1 | After action plan | 3 | Butchery | Food | A. Raw material (Raw chicken breast) | LM | 0 |
| C3/2-AL1 | After action plan | 3 | Butchery | Food | A. Raw material (Raw chicken breast) | SS | 0 |
| C3/2-AL2 | After action plan | 3 | Snacks | Food | B. Pre-prepared / prepared (Sliced watermelon) | EC | <1.0 |
| C3/2-AL2 | After action plan | 3 | Snacks | Food | B. Pre-prepared / prepared (Sliced watermelon) | LM | 0 |
| C3/2-AL2 | After action plan | 3 | Snacks | Food | B. Pre-prepared / prepared (Sliced watermelon) | SS | 0 |
| C3/2-AL3 | After action plan | 3 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped escarole) | EC | <1.0 |
| C3/2-AL3 | After action plan | 3 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped escarole) | LM | 0 |
| C3/2-AL3 | After action plan | 3 | Pre-preparation | Food | B. Pre-prepared / prepared (Sanitized and chopped escarole) | SS | 0 |
| C3/2-AL4 | After action plan | 3 | Kitchen | Food | D. Cooked (Chicken and vegetable soup) | EC | <1.0 |
| C3/2-AL4 | After action plan | 3 | Kitchen | Food | D. Cooked (Chicken and vegetable soup) | CPS | <1.0 |
| C3/2-AL4 | After action plan | 3 | Kitchen | Food | D. Cooked (Chicken and vegetable soup) | LM | 0 |
| C3/2-AL4 | After action plan | 3 | Kitchen | Food | D. Cooked (Chicken and vegetable soup) | SS | 0 |
| C3/2-ÁGUA1 | After action plan | 3 | Pre-preparation | Water | Filter | EN | 0 |
| C3/2-ÁGUA1 | After action plan | 3 | Pre-preparation | Water | Filter | PS | 0 |
| C3/2-ÁGUA1 | After action plan | 3 | Pre-preparation | Water | Filter | WC36 | <3 |
| C3/2-ÁGUA1 | After action plan | 3 | Pre-preparation | Water | Filter | WC45 | <3 |
| C3/2-ÁGUA1 | After action plan | 3 | Pre-preparation | Water | Filter | WEC | <3 |
| C3/2-ÁGUA2 | After action plan | 3 | Dessert | Water | Filter | EN | 0 |
| C3/2-ÁGUA2 | After action plan | 3 | Dessert | Water | Filter | PS | 0 |
| C3/2-ÁGUA2 | After action plan | 3 | Dessert | Water | Filter | WC36 | 0.96 |
| C3/2-ÁGUA2 | After action plan | 3 | Dessert | Water | Filter | WC45 | 0.55 |
| C3/2-ÁGUA2 | After action plan | 3 | Dessert | Water | Filter | WEC | <3 |
| C3/2-ÁGUA3 | After action plan | 3 | Pre-preparation | Water | Tap | PS | 0 |
| C3/2-ÁGUA3 | After action plan | 3 | Pre-preparation | Water | Tap | WC36 | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/2-ÁGUA3 | After action plan | 3 | Pre-preparation | Water | Tap | WC45 | <3 |
| C3/2-ÁGUA3 | After action plan | 3 | Pre-preparation | Water | Tap | WEC | <3 |
| C3/2-ÁGUA4 | After action plan | 3 | Kitchen | Water | Tap | PS | 0 |
| C3/2-ÁGUA4 | After action plan | 3 | Kitchen | Water | Tap | WC36 | <3 |
| C3/2-ÁGUA4 | After action plan | 3 | Kitchen | Water | Tap | WC45 | <3 |
| C3/2-ÁGUA4 | After action plan | 3 | Kitchen | Water | Tap | WEC | <3 |
| C3/2-ÁGUA5 | After action plan | 3 | Dessert | Water | Tap | PS | 0 |
| C3/2-ÁGUA5 | After action plan | 3 | Dessert | Water | Tap | WC36 | 3.04 |
| C3/2-ÁGUA5 | After action plan | 3 | Dessert | Water | Tap | WC45 | 3.04 |
| C3/2-ÁGUA5 | After action plan | 3 | Dessert | Water | Tap | WEC | <3 |
| C3/2-AR3 | After action plan | 3 | Receiving area | Air | Over the counter with sink | YM | 2.04 |
| C3/2-AR3 | After action plan | 3 | Distribution | Air | Over the counter with sink | YM | 1.23 |
| C3/2-AR3 | After action plan | 3 | Dessert | Air | Inside thermal counter | YM | 1.40 |
| C3/2-AR3 | After action plan | 3 | Snacks | Air | Over the counter with sink | YM | 0.90 |
| C3/2-AR3 | After action plan | 3 | Dessert | Air | Over the counter | YM | 1.30 |
| C3/2-AR3 | After action plan | 3 | Kitchen | Air | Oven area | YM | 1.75 |
| C3/2-AR3 | After action plan | 3 | Pan storage | Air | Pots and pans shelf | YM | 1.32 |
| C3/2-AR3 | After action plan | 3 | Pre-preparation | Air | Over the counter | YM | 1.23 |
| C3/2-AR3 | After action plan | 3 | Kitchen | Air | Over the counter with sink | YM | 1.61 |
| C3/2-AR3 | After action plan | 3 | Butchery | Air | Inside thermal counter | YM | 1.46 |
| C3/2-MÃO1 | After action plan | 3 | Kitchen | Hand | Worker 10- before hand washing | AMC | 2.00 |
| C3/2-MÃO1 | After action plan | 3 | Kitchen | Hand | Worker 10- before hand washing | EC | 0 |
| C3/2-MÃO1 | After action plan | 3 | Kitchen | Hand | Worker 10- before hand washing | CPS | 0 |
| C3/2-MÃO2 | After action plan | 3 | Kitchen | Hand | Worker 10- after hand washing | AMC | 1.92 |
| C3/2-MÃO2 | After action plan | 3 | Kitchen | Hand | Worker 10- after hand washing | EC | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C3/2-MÃO2 | After action plan | 3 | Kitchen | Hand | Worker 10- after hand washing | CPS | 0 |
| C3/2-MÃO3 | After action plan | 3 | Kitchen | Hand | Worker 10- during shift | AMC | 3.17 |
| C3/2-MÃO3 | After action plan | 3 | Kitchen | Hand | Worker 10- during shift | EC | 0 |
| C3/2-MÃO3 | After action plan | 3 | Kitchen | Hand | Worker 10- during shift | CPS | 0 |
| C3/2-MÃO4 | After action plan | 3 | Snacks | Hand | Worker 11- before hand washing | AMC | 2.11 |
| C3/2-MÃO4 | After action plan | 3 | Snacks | Hand | Worker 11- before hand washing | EC | 0 |
| C3/2-MÃO4 | After action plan | 3 | Snacks | Hand | Worker 11- before hand washing | CPS | 0 |
| C3/2-MÃO5 | After action plan | 3 | Snacks | Hand | Worker 11- after hand washing | AMC | 1.95 |
| C3/2-MÃO5 | After action plan | 3 | Snacks | Hand | Worker 11- after hand washing | EC | 0 |
| C3/2-MÃO5 | After action plan | 3 | Snacks | Hand | Worker 11- after hand washing | CPS | 0 |
| C3/2-MÃO6 | After action plan | 3 | Snacks | Hand | Worker 11- during shift | AMC | 3.24 |
| C3/2-MÃO6 | After action plan | 3 | Snacks | Hand | Worker 11- during shift | EC | 0 |
| C3/2-MÃO6 | After action plan | 3 | Snacks | Hand | Worker 11- during shift | CPS | 0 |
| C3/2-MÃO7 | After action plan | 3 | Dessert | Hand | Worker 12- before hand washing | AMC | 0.77 |
| C3/2-MÃO7 | After action plan | 3 | Dessert | Hand | Worker 12- before hand washing | EC | 0 |
| C3/2-MÃO7 | After action plan | 3 | Dessert | Hand | Worker 12- before hand washing | CPS | 0 |
| C3/2-MÃO8 | After action plan | 3 | Dessert | Hand | Worker 12- after hand washing | AMC | 0 |
| C3/2-MÃO8 | After action plan | 3 | Dessert | Hand | Worker 12- after hand washing | EC | 0 |
| C3/2-MÃO8 | After action plan | 3 | Dessert | Hand | Worker 12- after hand washing | CPS | 0 |
| C3/2-MÃO9 | After action plan | 3 | Dessert | Hand | Worker 12- during shift | AMC | 2.53 |
| C3/2-MÃO9 | After action plan | 3 | Dessert | Hand | Worker 12- during shift | EC | 0 |
| C3/2-MÃO9 | After action plan | 3 | Dessert | Hand | Worker 12- during shift | CPS | 0 |
| C4/2-AL1 | After action plan | 4 | Cold chamber | Food | B. Pre-prepared / prepared (Sliced ham) | LM | 0 |
| C4/2-AL1 | After action plan | 4 | Cold chamber | Food | B. Pre-prepared / prepared (Sliced ham) | SS | 0 |
| C4/2-AL1 | After action plan | 4 | Cold chamber | Food | B. Pre-prepared / prepared (Sliced ham) | CPS | <1.0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C4/2-AL2 | After action plan | 4 | Pre-preparation | Food | B. Pre-prepared / prepared (Washed and sanitized spinach) | LM | 0 |
| C4/2-AL2 | After action plan | 4 | Pre-preparation | Food | B. Pre-prepared / prepared (Washed and sanitized spinach) | SS | 0 |
| C4/2-AL2 | After action plan | 4 | Pre-preparation | Food | B. Pre-prepared / prepared (Washed and sanitized spinach) | EC | <1.0 |
| C4/2-AL2 | After action plan | 4 | Pre-preparation | Food | B. Pre-prepared / prepared (Washed and sanitized spinach) | CPS | 0.30 |
| C4/2-AL3 | After action plan | 4 | Butchery | Food | A. Raw material (Raw fish) | LM | 0 |
| C4/2-AL3 | After action plan | 4 | Butchery | Food | A. Raw material (Raw fish) | SS | 0 |
| C4/2-AL3 | After action plan | 4 | Butchery | Food | A. Raw material (Raw fish) | CPS | 1.36 |
| C4/2-AL4 | After action plan | 4 | Kitchen | Food | D. Cooked (Roasted fish) | CPS | 0 |
| C4/2-AL4 | After action plan | 4 | Kitchen | Food | D. Cooked (Roasted fish) | LM | 0 |
| C4/2-AL4 | After action plan | 4 | Kitchen | Food | D. Cooked (Roasted fish) | SS | 0 |
| C4/2-ÁGUA1 | After action plan | 4 | Butchery | Water | Tap | PS | 0.84 |
| C4/2-ÁGUA1 | After action plan | 4 | Butchery | Water | Tap | WC36 | 3.04 |
| C4/2-ÁGUA1 | After action plan | 4 | Butchery | Water | Tap | WC45 | 3.04 |
| C4/2-ÁGUA1 | After action plan | 4 | Butchery | Water | Tap | WEC | <3 |
| C4/2-ÁGUA2 | After action plan | 4 | Dessert | Water | Tap | PS | 0 |
| C4/2-ÁGUA2 | After action plan | 4 | Dessert | Water | Tap | WC36 | <3 |
| C4/2-ÁGUA2 | After action plan | 4 | Dessert | Water | Tap | WC45 | <3 |
| C4/2-ÁGUA2 | After action plan | 4 | Dessert | Water | Tap | WEC | <3 |
| C4/2-ÁGUA3 | After action plan | 4 | Kitchen | Water | Tap | PS | 0 |
| C4/2-ÁGUA3 | After action plan | 4 | Kitchen | Water | Tap | WC36 | <3 |
| C4/2-ÁGUA3 | After action plan | 4 | Kitchen | Water | Tap | WC45 | <3 |
| C4/2-ÁGUA3 | After action plan | 4 | Kitchen | Water | Tap | WEC | <3 |
| C4/2-ÁGUA4 | After action plan | 4 | Dessert | Water | Filter | EN | 0 |
| C4/2-ÁGUA4 | After action plan | 4 | Dessert | Water | Filter | PS | 0 |
| C4/2-ÁGUA4 | After action plan | 4 | Dessert | Water | Filter | WC36 | <3 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C4/2-ÁGUA4 | After action plan | 4 | Dessert | Water | Filter | WC45 | <3 |
| C4/2-ÁGUA4 | After action plan | 4 | Dessert | Water | Filter | WEC | <3 |
| C4/2-MÃO1 | After action plan | 4 | Kitchen | Hand | Worker 13- before hand washing | AMC | 3.12 |
| C4/2-MÃO1 | After action plan | 4 | Kitchen | Hand | Worker 13- before hand washing | EC | 0 |
| C4/2-MÃO1 | After action plan | 4 | Kitchen | Hand | Worker 13- before hand washing | CPS | 0 |
| C4/2-MÃO2 | After action plan | 4 | Kitchen | Hand | Worker 13- after hand washing | AMC | 2.84 |
| C4/2-MÃO2 | After action plan | 4 | Kitchen | Hand | Worker 13- after hand washing | EC | 0 |
| C4/2-MÃO2 | After action plan | 4 | Kitchen | Hand | Worker 13- after hand washing | CPS | 0 |
| C4/2-MÃO3 | After action plan | 4 | Kitchen | Hand | Worker 13- during shift | AMC | 3.65 |
| C4/2-MÃO3 | After action plan | 4 | Kitchen | Hand | Worker 13- during shift | EC | 0 |
| C4/2-MÃO3 | After action plan | 4 | Kitchen | Hand | Worker 13- during shift | CPS | 0 |
| C4/2-MÃO4 | After action plan | 4 | Pre-preparation | Hand | Worker 14- before hand washing | AMC | 3.04 |
| C4/2-MÃO4 | After action plan | 4 | Pre-preparation | Hand | Worker 14- before hand washing | EC | 0 |
| C4/2-MÃO4 | After action plan | 4 | Pre-preparation | Hand | Worker 14- before hand washing | CPS | 0 |
| C4/2-MÃO5 | After action plan | 4 | Pre-preparation | Hand | Worker 14- after hand washing | AMC | 1.67 |
| C4/2-MÃO5 | After action plan | 4 | Pre-preparation | Hand | Worker 14- after hand washing | EC | 0 |
| C4/2-MÃO5 | After action plan | 4 | Pre-preparation | Hand | Worker 14- after hand washing | CPS | 0 |
| C4/2-MÃO6 | After action plan | 4 | Pre-preparation | Hand | Worker 14- during shift | AMC | 2.53 |
| C4/2-MÃO6 | After action plan | 4 | Pre-preparation | Hand | Worker 14- during shift | EC | 0 |
| C4/2-MÃO6 | After action plan | 4 | Pre-preparation | Hand | Worker 14- during shift | CPS | 0 |
| C4/2-MÃO7 | After action plan | 4 | Dessert | Hand | Worker 15- before hand washing | AMC | 2.38 |
| C4/2-MÃO7 | After action plan | 4 | Dessert | Hand | Worker 15- before hand washing | EC | 0 |
| C4/2-MÃO7 | After action plan | 4 | Dessert | Hand | Worker 15- before hand washing | CPS | 0 |
| C4/2-MÃO8 | After action plan | 4 | Dessert | Hand | Worker 15- after hand washing | AMC | 1.51 |
| C4/2-MÃO8 | After action plan | 4 | Dessert | Hand | Worker 15- after hand washing | EC | 0 |

| Lab code | Moment | Day | Area | Sample Group | Details | Micro-organism | Result |
|---|---|---|---|---|---|---|---|
| C4/2-MÃO8 | After action plan | 4 | Dessert | Hand | Worker 15- after hand washing | CPS | 0 |
| C4/2-MÃO9 | After action plan | 4 | Dessert | Hand | Worker 15- during shift | AMC | 2.80 |
| C4/2-MÃO9 | After action plan | 4 | Dessert | Hand | Worker 15- during shift | EC | 0 |
| C4/2-MÃO9 | After action plan | 4 | Dessert | Hand | Worker 15- during shift | CPS | 0 |