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LIFESTYLE CHOICES RELATED TO FOOD CONSUMPTION AND THEIR RELATIONSHIP TO DEPRESSION

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The Doctorate Program in Clinical Psychology
Illinois School of Professional Psychology
at National Louis University

CERTIFICATE OF APPROVAL

Clinical Research Project Title
Lifestyle Choices Related to Food Consumption and Their Relationship to Depression

This is to certify that the Clinical Research Project of

Steven L Jennings, Jr., M.A.

has been approved by the CRP
Committee on

The 16th of January 2023

as satisfactory for the CRP requirement
for the Doctorate of Psychology degree
with a major in Clinical Psychology

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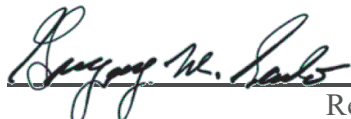
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Lifestyle Choices Related to Food Consumption and Their Relationship to Depression

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A Clinical Research Project submitted to the faculty of The Illinois School of Professional Psychology at National Louis University, Chicago in partial fulfillment of the requirements for the degree of Doctor of Psychology in Clinical Psychology.

Chicago, Illinois
December 2022

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Abstract

Dieting, or the act of restricting oneself to small amounts or particular kinds of foods on the basis of health, spirituality, lifestyle, and moral decisions, is a practice that dates to 1066 A.D. However, with social media being as influential as it is, one might believe dieting is a new obsession or at least an obsession to which popular culture is returning. Despite this, it is only in recent years that researchers have begun to focus on the health benefits of such behaviors. The present study was designed to take this focus a step further by exploring the potential risks and benefits of dieting on mental health. A self-report survey that contained a food frequency questionnaire and the Minnesota Multiphasic Personality Inventory–2 Depression scale was used to assess participants' dietary style over a year and their depressive symptoms. A total of 28 completed questionnaires (14 men and 14 women) were received for analysis. The multivariate linear regression that was intended could not be undertaken due to sample limitations. It was anticipated that large samples would be gathered across the three dietary styles. Due to COVID-19 and given the inability to acquire an adequate sample size, valid analysis was precluded, and the researcher was unable to conduct the study as anticipated. Thus, the reported findings are not significant. Suggestions for addressing the limitations of this study are offered for future research.

Lifestyle Choices Related to Food Consumption and Their Relationship to Depression

Chapter One: Introduction

In today's society, the fascination with weight reduction, healthy eating, and nutrition has resulted in the creation of numerous and varied diets. Research has primarily focused on the medical health benefits of different diets, such as veganism, vegetarianism, pescatarianism, the ketogenic diet, intermittent fasting, and others, often looking at their effects on blood pressure, cholesterol, heart disease, and other factors (Baines et al., 2007; Beezhold et al., 2010; Fraser, 2009; Hibbeln et al., 2017; Kaushik et al., 2015; Sharifan et al., 2017; Tanskanen et al., 2001). The body of evidence to support a relationship between dietary patterns and mental health is increasing. Though there is much focus on the health effects of such diets, there is not nearly as much research on the mental health effects of these diets. Much of the current research examining the relationship between dietary patterns and mental health has been shown to be contradictory or not significant. The purpose of the current study was to further the discussion of the mental health risks and benefits of particular diets and to influence future research in the direction of using changes in diet as potential interventions for the management of mental health disorders.

Depression

In the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*, the American Psychiatric Association (APA) reported the symptomology of a range of depressive disorders, the most severe of which is major depressive disorder (MDD). The *DSM-5* lists MDD as the experience of

five or more of the following symptoms occurring during a 2-week period with at least one of the symptoms being either depressed mood or loss of interest or pleasure: (a) depressed mood most of the day, nearly every day; (b) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day; (c) significant weight loss when not dieting or weight gain, or decrease or increase in appetite nearly every day; (d) a slowing down of thought and a reduction of physical movement (observable by others); (e) fatigue or loss of energy nearly every day; (f) feelings of worthlessness or excessive or inappropriate guilt nearly every day; (g) diminished ability to think or concentrate, or indecisiveness, nearly every day; and (h) recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. (American Psychiatric Association, 2013, p. 160)

Data from the World Health Organization (WHO) indicate more than 350 million individuals suffer from depression globally and the prevalence continues to rise in both developed and developing countries (Kim et al., 2016; Smith, 2014; Y. Zhang et al., 2017). Depression is projected to become the leading cause of the global burden of disease by 2030 (Albanese et al., 2012; Smith, 2014), highlighting the importance and need for research on potential risk factors and effective intervention strategies.

Though the prevalence of depression has risen globally, it varies from country to country and it has been reported that depression disproportionately affects the diverse populations within each country. A higher prevalence of depression has been known to affect middle-aged and older individuals in various parts of the world (Bountziouka et al.,

2009). It is vital to note that depression is also affected by socioeconomic and social factors, social connection, genetic predisposition, and physiology (Brigitta, 2002; Hasler, 2010). Furthermore, previous research has shown lifestyle factors such as diet, physical activity, sleep, substance use, employment status, and employment satisfaction are all related to depression (Kim et al., 2016). Based on the knowledge of the many factors that intersect in the development of depression, it is worth considering additional lifestyle changes and interventions that may assist in the prevention or management of depressive symptoms

There has been an emergence of literature within the past few decades on the use of dietary factors to either prevent or manage depressive symptoms (Anglin et al., 2013; Colangelo et al., 2014; Kim et al., 2016; Solati et al., 2015). Rather than focusing on specific foods or food groups, these studies have primarily focused on specific nutrients such as omega-3 fatty acids (Jacka et al., 2004; Kiecolt-Glaser et al., 2007) or vitamin B (folate, B6, B9, B12; Akbaraly et al., 2009; Stanger et al., 2009) and their mitigating qualities). Recent studies point to a deficiency in vitamin B12 and omega-3 fatty acids as a possible risk factor for depressive symptoms (Akbaraly et al., 2009; Anglin et al., 2013; Colangelo et al., 2014; Jacka et al., 2004; Kiecolt-Glaser et al., 2007; Kim et al., 2016; Solati et al., 2015). Though these studies provide a more narrow and specific view of certain nutrients and their effect on mental health, the general population may not always have the luxury of time or resources to focus so specifically on such specific dietary factors, be it due to issues with income, lack of access to healthy foods, or lack of education about healthy food choices. In addition, research has shown diet can vary widely due to culture, geographical location, personal ethics, and socioeconomic status,

and, as previously mentioned, these factors can affect the development of depression (Kim et al., 2016; Ruby, 2012; Smith, 2014; Y. Zhang et al., 2017).

In a study examining whole food patterns (healthy diet) and processed food patterns (poor diet), researchers found participants who engaged in a poor diet had a higher prevalence of depression as measured by the Center for Epidemiologic Studies Depression Scale (CES-D; Akbaraly et al., 2009). In this study, the researchers defined whole foods as fruits, fish, and vegetables, whereas processed foods included processed meats, high-fat dairy products, fried foods, sweetened desserts, and cereals. Taking socioeconomic status into account, it can be inferred that those in marginalized communities are often more likely to engage in poor dietary patterns. Not many researchers have examined the association between diet and depression, and though they did not look at individual food groups, they did examine whole diets such as vegetarianism and pescatarianism (Grosso et al., 2016; Jacka et al., 2010; Ventriglio et al., 2020).

Theories of Depression

There are many theories and hypotheses surrounding the development of depression stemming from a range of perspectives in the field of psychology. These hypotheses typically include psychosocial and biological theories. However, though many biological theories exist, there appears to be considerable overlap between them, suggesting researchers have likely chosen to focus on different elements of the pathophysiology of depression (Roy & Campbell, 2013). In addition, there is a discrepancy in the research suggesting a different basis for depression. Bench and clinical research suggest the bases of depression to be a biological phenomenon, whereas

population health studies suggest psychosocial factors to be the most significant risk factors (Roy & Campbell, 2013). There is considerable evidence to support the notion that the HPA-axis (hypothalamic-pituitary-adrenal axis) is a critical component in the body's stress response and is involved in depression. Deficiencies in vital nutrients such as zinc, iron, magnesium, selenium, omega-3 polyunsaturated fatty acids, vitamin C, vitamin E, and carbohydrates, all of which have been noted as risk factors for depression, also appear to affect the HPA-axis, resulting in impaired regulation and hyperactivity.

Vegetarianism

The practice of abstaining from meat has existed across humanity, dating back to ancient Africa. Though this practice stems back to ancient times, there are also many access-related, health-motivated, ethical, and spiritual motivations for doing so (Ruby, 2012). In recent years, the ethical and philosophical arguments regarding the abstention from meat, otherwise referred to as vegetarianism, have expanded to include anti-speciesism, anti-carnism, animal rights, and a feeling of community and identity with the animal world (Ruby, 2012). However, as there are varying arguments for the abstention from meat, there is also no universal definition of what is vegetarian (Kaushik et al., 2015; Rosenfeld, 2019; Ruby, 2012). Though many forms of vegetarianism include similar characteristics of limiting meat, fish, and poultry from the diet, some also eschew all animal products, including milk and other dairy products (Kaushik et al., 2015; Rosenfeld, 2019). Kaushik et al. (2015) listed the most common classifications of vegetarian diets as lacto-ovo-vegetarian, lacto-vegetarian, ovo-vegetarian, vegan, and semi-vegetarian, with each varying in their consumption of eggs, honey, and other dairy products. As noted by some scholars (e.g., Kaushik et al., 2015; Rosenfeld, 2019),

vegetarians with differing motivations also differ in their avoidance of meat, further complicating these groups' empirical assessment. Although popular media may lead one to assume the vegetarian diet is more popular than ever, the reported prevalence, though rising, remains relatively small. A Gallup poll conducted in 2018 in which researchers interviewed 1,033 adult participants via phone showed 5% of U.S. adults self-identified as vegetarian (Hrynowski, 2020). Within this study, the researchers reported non-White participants were three times as likely to self-identify as vegetarian than were White participants, whereas there was less prevalence of vegetarianism among older adults (aged 55+). Although the prevalence of vegetarianism in the United States is reportedly 5% of the population, the rates vary across the globe, as countries like India show 35% of the population following a vegetarian diet (Michalak et al., 2012).

Previous scholars (e.g., Baines et al., 2007; Beezhold et al., 2010; Fraser, 2009; Hibbeln et al., 2017; Kaushik et al., 2015) have found a vegetarian diet to be associated with a reduction in body mass, lowering the risk of high blood pressure, cardiovascular disease, stroke, diabetes, metabolic syndrome, and arteriosclerosis. However, though the vegetarian diet is associated with health benefits, it also has health risks such as anemia, protein deficiencies, lower levels of creatine in the muscles, hyperhomocysteinemia, and menstrual disruption in women who are involved in increased physical activity (Kaushik et al., 2015). In addition, Michalak et al. (2012) noted that on a cellular level, a vegetarian diet may have an effect on synaptic and neuronal function, therefore affecting processes in the brain that may work toward the prevention or maintenance of mental disorders. As the majority of the existing research focused on the association between the vegetarian

diet and physical health, there is relatively little but increasing knowledge on the association between the vegetarian diet and mental health (Askari et al., 2020).

There is not nearly as much research on the association between vegetarianism and mental health as there is on its association with medical health; much of the existing research is cross-sectional, therefore making a causal relationship unidentifiable within the literature (Kaushik et al., 2015; Rosenfeld, 2019; Ruby, 2012). In addition to the cross-sectional design of the existing research, many studies are contradictory or do not show significant results. Recent studies have provided varying claims about the association between vegetarianism and increased levels of depression (Rosenfeld, 2019). For example, in a cross-sectional study with 1,046 Australian women ranging in age from 20–93 years, Jacka et al. (2012) measured the extent to which a higher prevalence of mental disorders was related to a habitual unhealthy diet, defined as consuming less than and more than the recommended intake of red meat. Jacka et al. concluded women with lower meat consumption were two times as likely to be at risk for major depressive disorders as well as other affective disorders compared to those who consumed the recommended intake of red meat (see also Hibbeln et al., 2017; Jacka et al., 2010). The researchers were able to produce findings like those of Larsson and Johansson (2002), who examined 2,041 Swedish and Norwegian students and their lifestyle characteristics, comparing low-meat consumers to omnivores. Male and female low-meat consumers were reported to have a greater prevalence of depression compared to omnivores (Larsson & Johansson, 2002). However, the researchers noted socio-demographic and lifestyle factors, including the use of tobacco, physical activity, comorbid eating disorders, overall health, and attitudes about “being healthy,” as having been likely to

confound the results. Furthermore, researchers such as Thomas-Odenthal et al. (2020) have suggested healthy dieting and its benefits in terms of mental health may be exaggerated.

Due to the restriction of specific food groups, a focus on specific nutrients, or the examination of people unrepresentative of the larger community, the generalizability of previous literature regarding the topic of vegetarianism has been called into question. This was observed in a 2012 cross-sectional study examining participants from a German Health Interview and Examination Survey and a Mental Health Supplement; Michalak et al. used a one-item measure of vegetarian diet to measure associations between a vegetarian diet and mental disorders. Though they were able to corroborate the results of previous studies showing that despite some medical health benefits, the vegetarian diet is associated with poorer mental health, the construct validity of their results was weakened. As has been discussed, there needs to be more consensus in defining vegetarianism, and there are varying subtypes within the diet, making sampling that is genuinely representative of the community difficult. Thus, using the one-item dietary measure, Michalak et al.'s (2012) findings lacked construct validity.

Though many studies that do focus on diet and mental health continue to show an association between the vegetarian diet and depressive symptoms (e.g., Hibbeln et al., 2017), who found that vegetarian men are at a 1.67 times higher risk for depression than non-vegetarian men), others such as Beezhold et al. (2010) and Timko et al. (2012) have failed to replicate the findings of previous scholars (i.e., Jacka et al., 2012; Larsson et al., 2002; Michalak et al., 2012). Some researchers (i.e., Matta et al., 2018) suspect that any food group exclusion could be related to depressive symptoms, making vegetarian diets

an instance of a broader phenomenon. Again, this further highlights the inconclusive results that litter the research on diet and mental health, specifically vegetarianism. Despite the findings of Beezhold et al. (2010), Matta et al. (2018), and Jain et al. (2022), scholars continue to establish a positive association specifically between vegetarianism and depressive disorders. This point was emphasized by research conducted by Nezlek et al. (2018) as well as Jin et al. (2021), whose findings exhibited a higher risk of depression in vegetarians and semi-vegetarians compared to non-vegetarians as depression was shown to be higher among those who adhered to the vegetarian diet. Of note, both research teams' results were found in U.S. samples, and Jin et al. (2021) noted U.S. immigrants may experience additional stress related to diet due to cultural barriers and a lack of social support, thereby increasing the likelihood of depressive symptoms and suggesting the presence of moderators.

Pescatarianism/Pesco-Vegetarianism

Pescatarianism, by definition, is similar to vegetarianism in the exclusion of red meat and poultry. However, those who identify as pescatarians primarily consume fish and vegetables. Some scholars (e.g., Orlich et al., 2013) have referred to the diet as a pesco-vegetarian diet as it is essentially a plant-based diet with the inclusion of fish, shellfish, and other seafood as the primary sources of protein. Being referred to as a pesco-vegetarian diet makes the pescatarian diet a subset of vegetarianism; thus, it can be assumed that many of the health benefits and preventative factors of noncommunicable diseases observed in those who engage in a plant-based diet (e.g., cardiovascular, and neurological diseases, immunological disorders, diabetes, and cancer) would be present in those who engage in this primarily plant-based diet (Baines et al., 2007; Beezhold et

al., 2010; Bountziouka et al., 2009; Fraser, 2009; Hibbeln et al., 2017; Kaushik et al., 2015). Like the vegetarian diet, there continues to be a need for more research focusing on those who primarily eat a fish and plant-based diet with respect to mental health. Instead, much of the existing research looked at fish and its frequency of consumption within a diet while also examining its association with medical health (e.g. Orlich et al., 2013; Sharifan et al., 2017; Tanskanen et al., 2001). Though the topic of research may be medical health and fish related, much of the discussion becomes nutrient focused, centered on polyunsaturated fatty acids. With regard to the human diet, because omega-3 polyunsaturated fatty acids are mainly obtained through the consumption of fish and seafood (Tanskanen et al., 2001), it can be assumed that a reduction in fish consumption would lead to a reduction in omega-3 fatty acids.

In 2016, the first systematic review and meta-analysis of all observational studies related to the intake of fish as well as omega-3 fatty acids and their association with depression was conducted (Grosso et al., 2016). Results supported the hypothesis that fish consumption and omega-3 fatty acid intake are associated with a decreased risk of depression, which has even been demonstrated in other studies (Astorg et al., 2008; Barberger-Gateau et al., 2005; Bountziouka et al., 2009; Kyrozis et al., 2009; Li et al., 2011; Miyake et al., 2006; Murakami et al., 2010; Parletta et al., 2019; Sharifan et al., 2017; Strøm et al., 2009; Suominen-Taipale et al., 2010; Tanskanen et al., 2001; Timonen et al., 2004). Of the 31 studies Grosso and colleagues examined, 11 were found to have reported a significant relationship between the independent and dependent variables of fish consumption and depression. However, among the 31 studies, participant characteristics varied widely and many of the studies assessed a general population

(Grosso et al., 2016). Even within the general population, there are likely varying socio-demographic factors and lifestyle factors that make the findings challenging to generalize globally. Therefore, this raises the case for further research to be conducted with regard to a pescatarian or pesco-vegetarian diet.

Omnivore

A dietary style comprising vegetables, fruit, beef, lamb, fish, whole-grain foods, and legumes, also referred to as a traditional diet, has been found to be associated with a lower likelihood of depressive and anxiety disorders, whereas a dietary style comprising processed and “unhealthy” foods (i.e., Western diet) has been found to be associated with a higher likelihood of psychological symptoms and disorders (Jacka et al., 2010). The Mediterranean dietary style is an omnivore-based diet drawing from the cuisines of Spain, France, Italy, Greece, Morocco, Egypt, and Lebanon that has gained more and more popularity since the 1950s. Researchers first took note of this diet after observing that populations in the Mediterranean Sea basin appeared to be of better overall health, showing lower rates of cardiovascular and metabolic diseases (Hernández-Galiot & Goñi, 2017; Pike, 2021). Adding to its popularity may be the various and tasty methods of preparation stemming from many different cultures. In addition to its non-restrictive nature, it emphasizes the consumption of foods that are nutrient dense. Moreover, not only has the Mediterranean diet been shown to improve physical health, there also have been studies (e.g., Adjibade et al., 2018; Petersson & Philippou, 2016) in the last 10 years that continue to indicate the cognitive impacts are as meaningful. In a 2016 systematic review of five randomized clinical trials and 27 observational studies investigating the diet’s impact on cognitive health, researchers were able to show an association between

the Mediterranean dietary style and improved cognitive functioning, decreased risk for cognitive impairment, and decreased risk for dementia (Petersson & Philippou, 2016).

In addition to the cognitive impacts of the Mediterranean diet, it has been shown to have an impact on mental health, specifically mood. It is important to note that the Mediterranean diet is more of a lifestyle than it is just a diet, as there is an emphasis on physical activity, social connectivity, and relaxation. These are three vital components in the prevention and maintenance of depressive symptoms and may help to explain the lower rate of depression that has been observed among those with higher adherence to the Mediterranean dietary style (Adjibade et al., 2018; Bakırhan et al., 2022; Ventriglio et al., 2020; Yin et al., 2021).

An omnivore diet that may be even more popular is the American diet, often referred to as the Western diet. The opposite of nutrient-dense foods are foods with high calories, refined sugars, saturated fats, dyes, processed meats, and other foods that are banned in other areas of the world (Farah, 2019; Robinson, 2020). The importance of omega-3 fatty acids in the diet was previously noted, as was its exclusion's association with depressive symptoms; the American diet does not exclude these nutrients, though they may be low in density. The American diet does, however, include omega-6 fatty acid-dense foods, which have been shown to increase the risk of cardiovascular disease, obesity, diabetes, dementia, and depression (Beydoun et al., 2007; Grosso et al., 2014; Robinson, 2020; Shikany et al., 2015; Simopoulos, 2016).

Specific Aims/Hypothesis

This study was designed to examine the relationship between diet (i.e., pescatarian, vegetarian, omnivore) and depression. It was hypothesized that the omnivore

and vegetarian diets would have a higher prevalence of depression than the pescatarian or pesco-vegetarian diets.

Chapter Two: Methods

Design

This study was an observational cross-sectional design examining the relationships among four variables. The independent variables were the omnivore diet (control), the vegetarian diet, and the pescatarian diet and the dependent variable was the prevalence of depression as rated on the Depression scale of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2). Possible threats to internal validity included history, more specifically depression as a result of COVID-19, or other events occurring in participants' lives. Maturation may have also posed a threat to internal validity, as the participants may have learned new or more coping skills to manage depressive symptoms since they were assessed, as well as adjusted their diet over time. Furthermore, selection bias and attrition were included as likely threats.

With regard to construct validity, threats included single operations and narrow stimulus sampling due to the research design and experimenter expectancies. Possible threats to external validity related to the sample characteristics as well as the timing of the measures given.

Participants

Participants were randomly selected from Psychological Consultations, a private practice located in Chicago, Illinois. Random selection occurred by assigning clients a number based on the order in which they were seen at the practice and then using a random number generator to select participants. The study included 28 participants, as they were a sample of convenience. Consent was given by clients prior to intake with the private practice and they completed a consent form specific to this study prior to

participation. Permission to conduct the study was received from the practice owner and supervisor. Inclusion criteria included those age 17 years and older who had been seen at the practice within 365 days of the start of the study and had been diagnosed with depression. Other inclusion criteria included belonging to one of the three eating behavior groups (i.e., omnivore, pescatarian, vegetarian).

Measures

Minnesota Multiphasic Personality Inventory–2 (MMPI-2)

The MMPI-2 is a 567-item, true/false self-report measure of a person's psychological state. It has nine validity scales (or "lie" scales) assessing for lying, defensiveness, faking good, and faking bad. (Drayton, 2009). The MMPI-2 was normed and validated on 2,600 adults, and currently, over 10,000 published articles report on its validity and reliability. The MMPI's test–rest reliability is noted as .50 to .80, with Hypochondriasis being its most reliable scale (Helmes & Reddon, 1993). For the purpose of this study, only the Depression scale of the 10 available clinical scales was used. The Depression scale is noted to have concurrent and discriminant validity (Butcher et al., 2001).

EPIC Food Frequency Questionnaire

The European Prospective Investigation of Cancer Food Frequency Questionnaire (EPIC FFQ) is a list consisting of 131 food items that are evaluated using a set of nine questions examining frequency ranging from *never or less than once a month* to *6 or more times per day* (see Appendix A). The development of the food list was based on items from an FFQ widely used within the United States and the United Kingdom (Bingham et al., 1994; Rimm et al., 1992). However, to improve its suitability for the

population, the names of some British food items were adapted to the American equivalent and the survey was modified to fit an online platform (i.e., SurveyMonkey; Welch et al., 2005).

Demographics Questionnaire

The demographics questionnaire was added to the beginning of the FFQ (see Appendix A). Demographic information collected included age, gender, race/ethnicity, education, average amount of physical activity (weekly).

Literature Search

The electronic databases PubMed, PsycINFO, PsycINDEX, PsycARTICLES, PsycEXTRA, Education Source, Military & Government Collection, and Criminal Justice Abstracts with Full Text were searched for relevant articles using combinations of the following search terms: (diet OR diets OR dietary OR “diet quality” OR “dietary pattern” OR “dietary patterns”), (depression OR depressive OR mood), (pescatarian OR “fish consumption” OR “fish intake” OR seafood), (vegetarian OR vegetables OR “vegetable consumption” OR “vegetable intake”) AND (omnivore OR meat OR “meat consumption” OR “meat intake”).

Procedures

Participants were former or current clients of Psychological Consultations, a private practice in Chicago, Illinois. All clients signed a consent to email prior to intake with the practice and were contacted via email or text message to inquire about their willingness to participate in the current study and asked to complete a second consent form (see Appendix A) before participating. Consent from the practice had been given to contact clients. Following consent, a separate email/text message was sent containing the

FFQ (via SurveyMonkey) along with the demographics questionnaire. Upon return of the FFQ and demographics questionnaire, participants' MMPI-2 results were pulled from the files of Psychological Consultations; the Depression scale items were examined to determine rates and severity of depressive symptoms. Based on their FFQ responses, participants were assigned to a respective diet group: vegetarian, pescatarian, or omnivore (control group). Participants were informed that the purpose of the study was to examine their diet's relation to mental health and were also informed about potential risks related to their participation in the study, as well as provided an explanation regarding their confidentiality. Upon return of the FFQ and demographics questionnaire, participants were also debriefed via email.

Statistical Analysis

Socio-demographic characteristics were compared between the independent variables with Mann–Whitney U test and chi-square test for continuous and categorical variables, and the mean (standard deviation), median (interquartile range), or percentages were reported, respectively.

For hypothesis 1, a multivariate linear regression was planned with the IV: type of diet (vegetarian, pescatarian, and omnivore) followed by their cross-product, with rates of depression as the DV. Furthermore, a one-way ANOVA was planned to compare means and to determine significant differences between IVs (vegetarian, pescatarian, and omnivore). A total of 28 patients returned the questionnaire. Unfortunately, information on smoking status, alcohol use, and physical activity was not obtained. Additionally, due to insufficient sample sizes, no analysis could be conducted.

Chapter Three: Results

The participants' socio-demographic information is displayed in Table 1. Scores were available from 14 men (50%) and 14 women (50%). In terms of diet, 20 (71.4%) participants reported they were omnivores, consuming a typical diet consisting of meat, fish, and vegetables. Four (14.3%) participants each reported vegetarian and pescatarian diets. The study included four (14.3%) Asian/Pacific Islander participants, three (10.7%) African American/Black participants, four (14.3%) Hispanic/Latinx participants, and 17 (60.7%) Caucasian/White participants. The age range of the participants varied, with eight (28.6%) participants ages 18–29 years, 13 (46.4%) participants ages 30–39 years, one (3.6%) participants age 40–49 years, and three (10.7%) participants each reporting 50–59 and 60–69 years. Of the participants, 15 (53.6%) were single, 12 (42.9%) were married, and one (3.6%) was divorced. Twenty-two (78.6%) participants were employed and the remaining six (21.4%) were unemployed. Regarding years of education, three (10.7%) received 7–12 years of education, 11 (39.3%) received 13–16 years of education, and 14 (50%) received 17–22 years of education.

Table 1

Participant Demographics

Demographic characteristic	<i>N</i>	%
Gender		
Female	14	50.0%
Male	14	50.0%
Race		
Asian/Pacific Islander	4	14.3%
African American/Black	3	10.7%
Hispanic/Latinx	4	14.3%
Caucasian/White	17	60.7%
Diet		
Omnivore	20	71.4%

Demographic characteristic	<i>N</i>	%
Vegetarian	4	14.3%
Pescatarian	4	14.3%
Age		
18–29 years	8	28.6%
30–39 years	13	46.4%
40–49 years	1	3.6%
50–59 years	3	10.7%
60–69 years	3	10.7%
Marital status		
Single	15	53.6%
Married	12	42.9%
Divorced	1	03.6%
Employment status		
Employed	22	78.6%
Unemployed	6	21.4%
Years of education		
7–12 years	3	10.7%
13–16 years	11	39.3%
17–22 years	14	50.0%

Chapter Four: Discussion

The primary aim of this study was to investigate the associations between particular diets (i.e., omnivore, vegetarian, pescatarian) and depression in a clinical sample. Specifically, it was hypothesized that the association between diet and depression would be higher for omnivore and vegetarian diets than for pescetarian diets. The researcher was unable to test this hypothesis as the sample size precluded any valid statistical analysis. Many studies have shown vegetarians are physically healthier than non-vegetarians, as they have greater life expectancy and lower morbidity (Appleby et al., 1999; Baines et al., 2007; Key et al., 1999; Singh et al., 2003). In contrast, the analysis in the present study, which was initially taken from a sample that was randomly selected from clients seen within the past year at Psychological Consultations, was precluded due to having too small of a sample size.

Though the study was unable to produce unique findings, existing research has shown factors contributing to lower associations with depressive symptoms in pescatarians include vitamin B12 and omega fatty acid deficiency, of which red meat and fish provide a rich source. Stanger et al. (2009) suggested low levels of B12 and folate may increase the risk of depression. An increase in depressive symptoms could also be explained by deficiencies in calcium, vitamin D, zinc, and iron, which are common when excluding certain food items. Additionally, the present study did not consider the motivations for excluding animal products from one's diet, which may include health-related concerns that also contribute to the presence of depressive symptoms. Aside from health, the rationale for excluding meat from one's diet may be spiritual, environmental, or ethical, which are the most reported motivations (Michalak et al., 2012). Apart from

gender and the other socio-demographic information collected in this study, it remained difficult to ascertain whether the associations between diet and depression were the result of other individual characteristics.

Based on the findings presented in the existing peer-reviewed research, potential recommendations for clients might include adopting a pescatarian diet, the Mediterranean diet, or a Mediterranean-DASH intervention for neurodegenerative delay (MIND) or dietary approaches to stop hypertension (DASH) diet. It is crucial for those who choose to adhere to a vegetarian diet to properly plan and supplement what vital proteins, minerals, and vitamins may be missing due to food item exclusion. The Mayo Clinic recommends those who partake in a vegan or vegetarian diet pay special attention to including nutrients such as calcium, vitamin D, vitamin B12, protein, omega-3 fatty acids, iron, zinc, and iodine in their diet, further noting the challenge dieters may face in obtaining all the necessary nutrients, especially those following more restrictive diets (Mayo Clinic, 2020).

Regarding the Mediterranean diet, studies have shown it to be one of the healthiest dietary models, and those who adhere to such a diet have reported a significant reduction in depressive symptoms and improved mental health (Ventriglio et al., 2020). As aforementioned, the Mediterranean diet is more of a lifestyle than a diet, encompassing much more than just food intake. The frequent consumption of vegetables, fruits, nuts, seeds, legumes, potatoes, whole grains, herbs, spices, fish, seafood, and extra virgin olive oil, while sparingly consuming red meat, sugar-sweetened beverages, added sugars, processed meat, refined grains, refined oils, and other highly processed foods, is integral to adhering to this diet. However, it is also essential and recommended that those

who wish to reap the full benefits of the Mediterranean lifestyle prioritize social interaction, physical activity, and rest. Research continues to show that poor nutrition, lack of sleep, and physical activity are risk factors for developing and perpetuating depressive symptoms (e.g., Kaushik et al., 2015; Kim et al., 2016).

The DASH diet, also known as the dietary approach to stop hypertension, focuses on consuming foods rich in potassium, calcium, and magnesium as a means to help control blood pressure. It closely resembles the Mediterranean diet in that it is not an exclusion diet and follows similar consumption patterns, focusing on grains (6–8 servings), vegetables (4–5 servings), fruits (4–5 servings), fat-free dairy products (4–5 servings), lean meats (6 or fewer servings), fats and oils (2–3 servings), and nuts and legumes (4–5 servings). However, in this diet there is an additional focus on the reduction of sodium, recommending no more than 2,300 mg a day (1 teaspoon of table salt). The MIND diet is known as the Mediterranean-DASH intervention for neurodegenerative delay. Though it is a combination of the Mediterranean and the DASH diets, its aim is to reduce dementia and neurocognitive decline. Due to the observed benefits of the Mediterranean and DASH diets, such as reduced blood pressure and risk of heart disease, diabetes, and depression, researchers selected the foods best associated with brain health (Mayo Clinic, 2021). Its focus is on the consumption of green leafy vegetables (6+ servings a week), all other vegetables (daily), berries (twice weekly), nuts, olive oil, whole grains, fish, beans, poultry, and wine (1 glass). It also includes, of course, reducing the consumption of butter/margarine, red meats, cheese, and fried foods. It is necessary to note that as with all diets, one should consult with their primary care provider about the potential risks specific to them.

Healthcare professionals who are educated on nutrition and the gut-to-brain connection and who work closely with nutritionists are likely to benefit the health of their clients further. It is recommended that clinicians seek training in understanding how diet affects mental health and brain function as well as training in sleep disorders and their impact on mental functioning. In taking a holistic view of clients, professionals should consider recommending the pescatarian, Mediterranean, DASH, and MIND diets as potential courses of action for the reduction of depressive symptoms and an increase in other positive health outcomes. In addition to the recommendations made by clinicians, it would greatly benefit patients if professionals asked questions regarding dietary lifestyle, supplement intake, and other factors such as hours of sleep, sleep quality, sleep routine, physical activity, and work-related stress. Furthermore, along with the many other recommendations clinicians may make to their patients, they should be recommending routine labs to check B12, omega-3 fatty acids, and vitamin D levels, particularly in those adhering to a vegetarian or vegan diet. Clinicians may also find it helpful to assist patients in finding alternative ways to meet their nutritional needs if they choose to diet.

Existing research from Nutt et al. (2008), Pandi-Perumal and Kramer (2010), Wilson and Nutt (2013), M-M. Zhang et al. (2022), and others has repeatedly shown that sleep issues frequently accompany mental illness and those experiencing sleep-related problems are more likely to develop mental health-related problems. It is essential that clients get the recommended hours of sleep each night and that health professionals continue to discuss the importance of sleep with their clients. The discussion between client and healthcare professional may be more productive if clinicians received formal training or potentially a required academic course on sleep disorders and the importance

of sleep cycles and building a sleep routine. Pairing with other medical professionals in a setting such as an integrated behavioral health clinic would provide clients with a treatment team that includes nutritionists and sleep specialists.

As with many studies, the current study design was subject to limitations. The first of the limitations was the cross-sectional design, as it did not allow for a causal relationship. As a result, the researcher was unable to report on the direction of the relationship or whether other variables were present that affected the relationship between diet and depression. Additionally, asking participants to rely on their memory of their diet over the past year could have presented as a limitation due to the difficulty experienced in recalling such information. As such, report bias was likely a limitation of this study because participants may not have always accurately reported their behavior, and there is typically no way of verifying this information. Though the researcher initially sought a sample size of 100 participants, only 28 responded. Due to the low participation rate, the study had an insufficient sample size from which to draw valid conclusions from the statistical measures. The method of contact also presented as a limitation. The researcher reached out to 100 individuals via email and automated text messages, and there may have been a better response rate if the researcher had conducted in-person or phone discussions. Furthermore, the study was limited to the data collected by not including information regarding smoking, physical activity, or alcohol use in the demographics questionnaire. Strengths included the use of normed and validated assessments (i.e., the MMPI-2 and the FFQ). The MMPI-2 remains one of the most widely used and researched psychological assessment tools.

Potential threats to validity also related to history, which included the COVID-19 pandemic. In more detail, the COVID-19 pandemic put a strain on the world and its function that could not have been foreseen. COVID-19 is a respiratory disease that was mild for some but has also caused millions of deaths around the world. The pandemic's effects on diet and mental health were overwhelmingly deleterious. The quarantine put in place to stop the spread of COVID-19 further affected individuals by limiting their ability to work due to business closures and layoffs. Business closings and layoffs had a trickle-down effect on individuals' ability to access food, whether it was a result of the quarantine itself, the lack of income to afford food items, or the closures/lack of staff in the establishments that remained open.

The pandemic also had an impact on mental health as a result of the isolative periods, loss of loved ones, and the aforementioned effects of the quarantine. COVID-19's effects considerably influenced the results of this study. It may be of benefit to conduct this study in the near future to further understand the pandemic's impact on the results. Maturation also threatened internal validity, as the participants may have learned new or more coping skills to manage depressive symptoms since they were assessed and adjusted their diet over time.

Furthermore, selection bias and attrition were included as likely threats. With regard to constructing validity, threats included single operations and narrow stimulus sampling due to the research design and experimenter expectancies. At the same time, possible threats to external validity related to the sample characteristics as well as the timing of the measures given.

Conclusion

In the present study, the researcher attempted to examine the relationship between diet and depression, but was unable to produce any findings due to sample size limitations. Future prospective studies are required to further delineate this relationship and its mediating factors. As it is not typical to pull an individual scale from the MMPI-2 and there is little to no research on doing so, to provide further generalizable information, future researchers should consider using a standalone measure of depression such as the Patient Health Questionnaire-9 (PHQ-9) or Beck Depression Inventory. Given the inability to conduct the study as anticipated, the researcher proposes two plans of action for future research to obtain generalizable and significant data. The first is to compare scores obtained on the FFQ between a sample of depressed participants and the results of published research that examined the FFQ scores of non-depressed participants. The second, with acknowledgment to the limitations the pandemic placed upon the research, is for future researchers to select a large enough sample size of participants to include a non-depressed control group. In this study, it was observed that all vegetarians identified as male. This raises the question of whether there are higher rates of vegetarian or vegan diet adherence among men, in general, and whether there are gender differences observed in adherence to and potential benefits of specific diets. This is a potential area of exploration in future research. Due to the previously mentioned limitations of the study, the researcher proposes that those conducting future research consider a causal study design to further understand the direction of the association between diet and depressive symptoms. The researcher also suggests the use of a daily FFQ as this may provide more reliable data on each participant's diet. Including information on smoking, physical

activity, and alcohol use in the demographics questionnaire would allow for the collection of more data on additional factors that can affect depressive symptoms. The present study was attempted using a convenience sample specific to one of the 77 neighborhoods in Chicago, including a population of 77.6% White, 4% Black, 3.6% Hispanic, 6.9% Asian, and 2.9% other. The demographics of the study were somewhat reflective of the neighborhood's demographics. The researcher proposes that the study be conducted with larger sample sizes but also specific or mixed ethnic populations to allow for further generalizability of the information. The future of research may benefit from such a study being conducted in more rural areas of the United States or perhaps in international regions. Additionally, recognizing the lasting effects of the COVID-19 pandemic, the researcher proposes that the study be reconducted without the restrictions placed upon the world and their dieting and overall health habits.

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Appendix A: Survey, Consent, and Demographics

What Do You Eat? FFQ

***This Food Frequency Questionnaire has been slightly adapted from the European Prospective Investigation of Cancer Food Frequency Questionnaire produced by MeDesing.**

Thank you for participating in our survey. Your feedback is important.

This questionnaire will ask for some background information on you, specifically, on what you eat.

Your answers will be treated as strictly confidential and will be used only for research purposes.

Please answer every question. If you are uncertain about how to answer a question then do the best you can, but please do not leave a question blank.

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

1. Contact Info

Name

City/Town State/Province Email Address

-- select state --

2. What is your ethnic/cultural/racial background?

What Do You Eat?

Informed Consent

My name is Steven Jennings, and I am a Doctoral Student at National Louis University. I am asking you to participate in this study, “Lifestyle Choices Related to Food Consumption and Their Relationship to Depression”, occurring from 10- 2020 to 10- 2021. The purpose of the study is to assess your dietary habits over the past year, and how they may relate to your mental health. This study will help researchers develop a deeper understanding

of and interventions that can guide mental health and nutrition. This form outlines the purpose of the study and provides a description of your involvement and rights as a participant.

By signing below, you are providing consent to participate in a research project conducted by Steven Jennings, student, at National Louis University, Chicago.

Please understand that the purpose of the study is to explore the process and impact of eating behavior and not to change your eating behavior.

Participation in this study will include: Completion of two surveys:

Survey 1 has already been completed upon your intake and/or testing with Psychological Consultations and/or Agave Studio. This survey included the Minnesota Multiphasic Personality Inventory-Second Edition that you completed during that time.

Survey 2 will be sent to your email address during (time frame for survey distribution) and is expected to take approximately 15 minutes to complete.

Your participation is voluntary and can be discontinued at any time without penalty or bias. The results of this study may be published or otherwise reported at conferences and employed to inform coaching practices.

Participants identifying information will be collected in order to match Survey 1 with Survey 2, however participants identities will not be revealed (data including: names will not be included in reported research). To ensure confidentiality, the researcher(s) will secure the completed surveys in a locked cabinet in their university office; the data file of compiled results will be kept in a password protected folder on an internal university workspace. Only the individuals listed on this document will have access to data.

There are no anticipated risks or benefits, no greater than that encountered in daily life. Upon request you may receive summary results from this study and copies of any publications that may occur. Please email the researcher, Steven Jennings at [REDACTED] to request results from this study.

In the event that you have questions or require additional information, please contact the researcher, Steven Jennings, [REDACTED], [REDACTED].

If you have any concerns or questions before or during participation that have not been addressed by the researcher, you may contact Dr. Kristen Newberry; email: kcarneynewberry@nl.edu, the co- chairs of NLU's Institutional Research Board: Dr. Shaunti Knauth; email: Shaunti.Knauth@nl.edu; phone: (312)261-3526; or Dr. Kathleen Cornett; email: kcornett@nl.edu; phone: (844) 380-5001. Co-chairs are located at National Louis University, 122 South Michigan Avenue, Chicago, IL.

Thank you for your consideration.

Consent: I understand that by signing below, I am agreeing to participate in the study (Lifestyle Choices Related to Food Consumption and Their Relationship to Depression).

My participation will consist of the activities below during 10/2020 through 10/2021:

Completion of two surveys, with survey 1 having previously been completed and survey 2 taking approximately 15 minutes to complete.

3. Do you consent to participating in the study? Yes

No

What Do You Eat?

Meats and Fish

This questionnaire will ask for some background information on you, specifically, on what you eat.

Your answers will be treated as strictly confidential and will be used only for research purposes.

Please answer every question. If you are uncertain about how to answer a question then do the best you can, but please do not leave a question blank.

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

4. Beef: roast, steak, mince, stew or casserole Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

5. Beef Burgers

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

6. Pork: roast, chops, stew or slices Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

7. Lamb: roast, chops or stew Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

8. Chicken or other poultry eg. turkey Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

9. Bacon

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

10. Ham

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

11. Corned beef, Spam, luncheon meats Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

12. Sausages

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

13. Savory pies, eg. meat pie, pork pie, pasties, steak & kidney pie, sausage rolls Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

14. Liver, liver paté, liver sausage Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

15. Fried fish in batter, as in fish and chips Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

16. Other white fish, fresh or frozen, eg. cod, haddock, plaice, sole, halibut Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

17. Oily fish, fresh or canned, eg. mackerel, kippers, tuna, salmon, sardines, herring Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

18. Shellfish, eg. crab, prawns, mussels Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

19. Fish roe, taramasalata Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

What Do You Eat?

BREADS AND SAVORY BISCUITS (one slice or biscuit)

20. White bread and rolls Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

21. Brown bread and rolls Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

22. Wholemeal bread and rolls Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

23. Cream crackers, cheese biscuits Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

24. Crispbread, eg. Ryvita Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

What Do You Eat?

CEREALS (one bowl)

25. Porridge, Readybrek

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

26. Breakfast cereal such as cornflakes, muesli etc. Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

What Do You Eat?

POTATOES, RICE AND PASTA (medium serving)

27. Boiled, mashed, instant or jacket potatoes Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

28. Chips

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

29. Roast potatoes

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

30. Potato salad

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

31. White rice

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

32. Brown rice

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

33. White or green pasta, eg. spaghetti, macaroni, noodles Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

34. Wholemeal pasta

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

35. Lasagne, moussaka

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

36. Pizza

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

37. Single or sour cream (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

What Do You Eat?

DAIRY PRODUCTS AND FATS

38. Double or clotted cream (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

39. Low fat yogurt, fromage frais (125g carton) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

40. Full fat or Greek yogurt (‘ 25g carton) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

41. Dairy desserts (125g carton) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

42. Cheese, eg. Cheddar, Brie, Edam (medium serving) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

43. Cottage cheese, low fat soft cheese (medium serving) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

44. Eggs as boiled, fried, scrambled, etc. (one) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

45. Quiche (medium serving) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

46. Low calorie, low fat salad cream (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

47. Salad cream, mayonnaise (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

48. French dressing (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

49. Other salad dressing (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

What Do You Eat?

The following on bread or vegetables

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

50. Butter (teaspoon)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

51. Block or hard margarine, eg. Stork, Krona (teaspoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

52. Polyunsaturated margarine, eg. Flora, sunflower, soya spreads (teaspoon) Never or less than

once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

53. Soft margarines, including olive oil based and dairy spreads, eg. Blue Band, Olivio/ Bertolli,

Clover (teaspoon)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

54. Lowfat spreads (less than 60% fat), eg. Outline, Gold (teaspoon) Never or less than

once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

55. Very low fat spread (less than 30%fat)(teaspoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

What Do You Eat?

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

56. Sweet biscuits, chocolate , eg. digestive (one) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

57. Sweet biscuits, plain, eg. Nice, ginger (one) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

58. Cakes eg. fruit, sponge, home baked Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

SWEETS AND SNACKS (medium serving)

59. Cakes eg. fruit, sponge, ready made Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

60. Buns, pastries, scones, flapjacks, home baked Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

61. Buns, pastries, scones, flapjacks, ready made Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

62. Fruit pies, tarts, crumbles, home baked Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

63. Fruit pies, tarts, crumbles, ready made Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

64. Sponge puddings, home baked Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

65. Sponge puddings, ready made Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

66. Milk puddings, eg. rice, custard, trifle Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

67. Ice cream, choc ices

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

68. Chocolates, single or squares Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

69. Chocolate snack bars eg. Mars, Crunchie Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

70. Sweets, toffees, mints Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

71. Sugar added to tea, coffee, cereal (teaspoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

72. Crisps or other packet snacks, eg. Wotsits Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

73. Peanuts or other nuts Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

What Do You Eat?

SOUPS, SAUCES, AND SPREADS

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

74. Vegetable soups (bowl) Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

75. Meat soups (bowl)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

76. Sauces, eg. white sauce, cheese sauce, gravy (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

77. Tomato ketchup (tablespoon) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

78. Pickles, chutney (tablespoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

79. Marmite, Bovril (teaspoon) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

80. Jam, marmalade, honey (teaspoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

81. Peanut butter (teaspoon) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

What Do You Eat?

DRINKS

82. Tea (cup)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

83. Coffee, instant or ground (cup) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

84. Coffee, decaffeinated (cup) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

85. Coffee whitener, eg. Coffee-mate (teaspoon) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

86. Cocoa, hot chocolate (cup) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

87. Horlicks, Ovaltine (cup) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

88. Wine (glass)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

89. Beer, lager or cider (half pint) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

90. Port, sherry, vermouth, liqueurs (glass) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

91. Spirits, eg. gin, brandy, whisky, vodka (single) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

92. Low calorie or diet fizzy soft drinks (glass) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

93. Fizzy soft drinks, eg. Coca cola, lemonade (glass) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

94. Pure fruit juice (100%) eg. orange, apple juice (glass) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

95. Fruit squash or cordial (glass) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

What Do You Eat?

FRUIT For seasonal fruits marked *, please estimate your average use when the fruit is in season

96. Apples (1 fruit) ,

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

97. Pears (1 fruit)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

98. Oranges, satsumas, mandarins (1 fruit) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

99. Grapefruit (half)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

100. Bananas (1 fruit)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

101. Grapes (medium serving) Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

102. Melon (1 slice)

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

103. * Peaches, plums, apricots (1 fruit) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

104. * Strawberries, raspberries, kiwi fruit (medium serving) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

105. Tinned fruit (medium serving) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

106. Dried fruit, eg. raisins, prunes (medium serving) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please click the option to best indicate how often , on average, you have eaten the specified amount of each food during the past year.

What Do You Eat?

VEGETABLES Fresh, frozen, or tinned (medium serving)

107. Carrots

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

108. Spinach

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

109. Broccoli, spring greens, kale Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

110. Brussels sprouts

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

111. Cabbage

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

112. Peas

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

113. Green beans, broad beans, runner beans Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

114. Marrow, courgettes Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

115. Cauliflower

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

116. Parsnips, turnips, swedes Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

117. Leeks

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

118. Onions

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

119. Garlic

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

120. Mushrooms

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

121. Sweet peppers

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

122. Beansprouts

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

123. Green salad, lettuce, cucumber, celery Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

124. Watercress

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

125. Tomatoes

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

126. Sweetcorn

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

127. Beetroot

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

128. Coleslaw

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

129. Avocado

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

130. Baked beans

Never or less than once/month 1-3 per month

Once a week

2-4 per week

5-6 per week

Once a day

2-3 per day

4-5 per day

6+ per day

131. Dried fruit, eg. raisins, prunes (medium serving) Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

132. Dried lentils, beans, peas Never or less than once/month 1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

133. Tofu ,soya meat, TVP, Vegeburger Never or less than once/month

1-3 per month

Once a week

2-4 per week 5-6 per week Once a day 2-3 per day 4-5 per day 6+ per day

What Do You Eat?

YOUR DIET LAST YEAR, continued

134. Are there any OTHER foods which you ate more than once a week? Yes

No

What Do You Eat?

YOUR DIET LAST YEAR, continued

135. Please list any OTHER foods which you ate more than once a week. Please list Food / Usual
Serving Size / Number of Times Eaten Each Week

What Do You Eat?

YOUR DIET LAST YEAR, continued

136. What type of milk did you most often use? Full cream/whole

Skimmed

Dried Milk Semi-skimmed Channel Islands gold Soya

None

Other (please specify)

137. How much milk did you drink each day, including milk with tea, coffee, cereals etc? None

Quarter of a pint

Half of a pint

Three quarters of a pint One pint

More than one pint

138. Did you usually eat breakfast cereal (excluding porridge and Ready Brek mentioned earlier)?

Yes

No

If Yes, please list the one or two types most often used. (ie. Kellogg's/Cornflakes)

139. What kind of fat did you most often use for frying, roasting, grilling etc? Butter

Lard/dripping Vegetable oil

Solid vegetable fat Margarine

None

If you used vegetable oil, please give type eg. corn, sunflower.

140. What kind of fat did you most often use for baking cakes etc? Butter

Lard/dripping Vegetable oil

Solid vegetable fat Margarine

None

If you used margarine, please give name eg. Flora, Stork.

What Do You Eat?

141. How often did you eat food that was fried at home? Daily

1-3 times a week

4-6 times a week

Less than once a week Never

142. How often did you eat fried food away from home? Daily

1-3 times a week

4-6 times a week

Less than once a week Never

143. What did you do with the visible fat on your meat? Ate most of the fat

Ate some of the fat

Ate as little as possible Did not eat meat

144. How often did you eat grilled or roast meat?

145. How well cooked do you usually have grilled or roast meat? Well done /dark brown

Medium

Lightly cooked/rare Did not eat meat

146. How often did you add salt to food while cooking? Always

Usually Rarely Never Sometimes

147. How often did you add salt to any food at the table? Always

Usually Rarely Never Sometimes

148. Did you regularly use a salt substitute (eg. LoSalt)? Yes

No

What Do You Eat?

What Diet Do You Identify With?

The choices are (Vegetarian, Pescatarian, Omnivore/typical). You are provided the option of typing your answer if it is more specific.

149. What Diet Do You Identify With?