

Article

Omega-3 Fatty Acids in Chinese-Western Fusion Vegan Dishes: Nutritional Strategies for Vegans

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Abstract: In modern dietary culture, Omega-3 fatty acids are widely considered to be key nutrients for maintaining heart and brain health. However, for vegans, it is a challenge to effectively supplement this important nutrient because traditional sources of Omega-3 such as fish oil are not applicable. This study aims to explore how Chinese-Western fusion vegan cuisine can become an effective way for vegans to supplement Omega-3, which not only enriches the dietary choices of vegans but also improves the nutritional value of dishes. This paper first reviews the physiological functions of Omega-3 fatty acids and their importance to health, and then reviews the existing literature on plant-based Omega-3 sources, such as flaxseed, perilla seed oil and seaweed. The article focuses on the potential of Chinese-Western fusion vegan dishes to enhance the innovative use of these plant-based sources, such as increasing the bioavailability and overall absorption of omega-3 through specific cooking techniques and ingredient combinations. Through the ingredient analysis of several specific Chinese-Western fusion vegan dishes, this study shows how these dishes can effectively provide omega-3 fatty acids. These dishes include Western salads with Chinese seasonings and traditional Eastern dishes with Western premium ingredients. They not only break the boundaries of traditional vegan cuisine but also demonstrate the innovative ability of Chinese-Western fusion cuisine to provide key nutrients. This study also discusses the preparation and nutritional assessment methods of Chinese-Western fusion vegan dishes to ensure the scientific and practical application value of the research. Finally, the article explores the role of these findings in promoting healthy eating habits of vegans and possible directions for future research on Chinese-Western fusion vegan cuisine. In summary, through the innovative fusion of Chinese and Western vegan cuisine, this study not only provides a new omega-3 fatty acid supplementation strategy for vegans but also contributes new perspectives and methods to the development of global healthy dietary culture. This study emphasizes the important role of the fusion of Chinese and Western cuisine in promoting the diversity and nutritional balance of human healthy diet.

Keywords: omega-3 fatty acids; Chinese-Western fusion cuisine; vegan food; nutritional supplements; plant-based sources; cross-cultural diet

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1. Introduction

1.1. Importance of Omega-3 Fatty Acids and Their Health Benefits

Omega-3 fatty acids are a type of polyunsaturated fatty acid that is essential to human health, especially its role in promoting cardiovascular and cerebrovascular health. Scientific research shows that omega-3 fatty acids have a variety of physiological functions, including but not limited to reducing the risk of heart disease, anti-inflammatory effects, promoting brain development and function, and improving mental health [1].

In terms of cardiovascular health, omega-3 fatty acids can effectively reduce triglyceride levels in the blood, reduce the risk of heart attacks, and may help reduce high blood

pressure. In addition, this type of fatty acid also shows strong potential in anti-inflammatory effects. They can inhibit inflammatory responses in the body and help control inflammatory diseases such as rheumatoid arthritis.

In terms of the nervous system, omega-3 fatty acids are particularly critical for brain health. Studies have shown that they play an important role in children's brain development and can improve cognitive function and emotional health in adults. In particular, DHA (docosahexaenoic acid), which is a major component of brain cell membranes, is essential for memory and learning ability [2].

Although the benefits of omega-3 fatty acids are widely recognized, obtaining these important fatty acids is a challenge for vegans because traditional omega-3 sources such as fish oil and seafood are not suitable for them. Therefore, exploring effective plant-based omega-3 sources and how to enhance their bioavailability and overall absorption through innovative Chinese-Western fusion vegan cuisine has become the focus of this study.

1.2. Difficulties Vegans Face in Obtaining Omega-3 Fatty Acids in Traditional Diet

Despite the many proven benefits of omega-3 fatty acids for human health, vegans face significant challenges in getting these key nutrients in their daily diets. EPA (eicosatetraenoic acid) and DHA, which are primarily found in fish oil and marine organisms, are not suitable for vegans who do not consume any animal products.

While ALA (alpha-linolenic acid), a form of omega-3 fatty acids, is found in plant foods such as flaxseed oil, walnuts, and canola oil, the body is inefficient in converting ALA to EPA and DHA. Studies have shown that the conversion rate of ALA to EPA is typically less than 10%, and the conversion rate to DHA is at least an order of magnitude lower. This inefficient conversion rate makes it difficult for vegans to reach the recommended intake of EPA and DHA, even when eating plant foods rich in ALA [3].

In addition, many common plant-based omega-3 sources, such as flaxseeds and walnuts, may not be easily incorporated into traditional dietary habits or are easily lost in the cooking process. Therefore, exploring how to innovatively increase the intake of plant-based omega-3 through Chinese-Western fusion vegan cuisine has become the key to supporting the healthy lifestyle of vegans.

The needs in this context gave rise to the core question of this study: how to creatively provide more effective plant-based omega-3 fatty acid sources through Chinese-Western fusion vegan dishes while respecting the principles of vegan diet, so as to improve the nutritional intake and overall health of vegans.

1.3. How Can Chinese-Western Fusion Vegan Dishes Help Vegans Effectively Supplement Omega-3 Fatty Acids

The main purpose of this study is to explore and validate the potential and effectiveness of Chinese-Western fusion vegan cuisine in enhancing omega-3 fatty acid intake for vegans. Through innovative ingredient combinations and cooking techniques, this study aims to develop new dishes that are not only delicious but also effective in providing bioavailable plant-based omega-3 fatty acids. The research objectives include:

Identify high omega-3 plant-based ingredients suitable for Chinese-Western fusion cuisine, such as flax seeds, perilla seeds, seaweed, etc., and evaluate their omega-3 content and stability under different cooking conditions.

Design and test methods to incorporate these plant-based ingredients into Chinese-Western fusion cuisine, such as using flax seed oil to make Chinese-flavored pasta or incorporating seaweed into Western salads.

Evaluate the nutritional content of these dishes, especially the bioavailability of omega-3, and the acceptance and satisfaction of these new dishes by target consumers through laboratory analysis and consumer tasting.

Raise public awareness of omega-3 fatty acids and their importance in vegan diets through education and promotion activities, while demonstrating innovative ways for Chinese-Western fusion vegan cuisine to provide this key nutrient.

By achieving these goals, this research hopes to provide vegans with a new, practical solution to improve their omega-3 fatty acid intake to support their long-term health and well-being. In addition, this research will provide valuable insights into global healthy dietary patterns, especially in promoting the nutritional value and diversity of plant-based foods.

2. Literature Review

2.1. Omega-3 Fatty Acids Sources and Effects

Omega-3 fatty acids are an important class of polyunsaturated fatty acids that have many benefits for human health [4]. They mainly include three types: ALA, EPA and DHA. These fatty acids are essential for maintaining cardiovascular health, anti-inflammatory and supporting neural development [5].

2.1.1. Traditional Omega-3 Sources

Fish oil is the most direct source of EPA and DHA, especially oily fish such as salmon, mackerel and sardines. The effects of EPA and DHA in preventing cardiovascular disease, treating depression and promoting brain health have been widely studied and recognized [6].

Flaxseed and flaxseed oil are one of the main sources of plant-based omega-3 (ALA), and flaxseed and flaxseed oil are particularly important in vegan and vegan diets. Although the conversion efficiency of ALA to EPA and DHA is low, its potential health benefits in anti-inflammatory and cardiovascular protection cannot be ignored.

Walnuts, hemp seeds and rapeseed oil are also good sources of ALA [7]. These ingredients can be used as a supplement to increase the intake of omega-3 in the diet, especially for those who limit or avoid animal products.

2.1.2. Physiological Effects

Studies have shown that omega-3 fatty acids can reduce the risk of heart disease by lowering triglyceride levels in the blood, reducing arterial inflammation and preventing blood clots.

Omega-3 fatty acids have the ability to reduce chronic inflammation, which is particularly important for treating inflammatory diseases such as arthritis and inflammatory bowel disease.

EPA and DHA are particularly critical for brain health, helping to maintain the structure and function of nerve cells, improving memory, and even helping to slow the process of cognitive decline [8].

Through a detailed review of these traditional sources and physiological effects, this study aims to further explore how to innovatively increase omega-3 fatty acid intake for vegans through Chinese-Western fusion vegan cuisine while maintaining the principles of their plant-based diet.

2.2. Vegan Sources of Omega-3 Fatty Acids

The growing number of people who are vegan or seeking non-seafood sources of omega-3 has prompted researchers and dietitians to look for effective plant-based sources of omega-3. Although the body is less efficient in converting the main plant-based omega-3 to EPA and DHA, these sources are still a key way for vegans to obtain this important nutrient.

Flaxseed is one of the richest foods in ALA, with each tablespoon of flaxseed oil containing approximately 7.3g of ALA. Flaxseed can be eaten whole, ground or pressed into oil for use in a variety of dishes. Studies have shown that regular consumption of flaxseed

can help increase blood levels of EPA, although the conversion to DHA is still less efficient [9].

Perilla seed oil is another high-content plant-based source of omega-3, especially common in Asian diets [10]. Perilla seed oil contains a higher percentage of ALA than flaxseed oil and has shown higher antioxidant properties in some studies. Perilla seed oil is an excellent choice for providing healthy fats in salads, seasonings, and cooking.

Seaweed, especially kelp and wakame, is one of the few plant-based foods that contains EPA. Certain types of seaweed have also been found to contain small amounts of DHA [11], making it a very valuable source of Omega-3 for vegans. In addition to eating, it directly, seaweed is often processed into supplements and powders to provide additional nutritional support in the daily diet.

Although walnuts do not contain as much ALA as flaxseed and perilla seeds, they are still a good choice, with about 2.5g of ALA per 28g of walnuts [12]. Other types of nuts, such as almonds and hazelnuts, although lower in Omega-3 content, can still be used as a supplemental source of healthy fats.

Through the discussion of these plant-based sources, this article aims to show how Chinese-Western fusion vegan cuisine can innovatively integrate these ingredients, which not only enriches the dietary choices of vegans but also improves the nutritional value of the dishes. Future research can further explore how to optimize the use of these ingredients to maximize their health benefits in a vegan diet.

2.3. Innovation of Chinese-Western Fusion Vegan Dishes

Fusion vegan cuisine innovatively increases the content and bioavailability of plant-based omega-3 fatty acids by combining elements and techniques of Chinese and Western cooking. This cooking method not only increases the variety and taste of food but also helps improve the absorption rate of key nutrients, which is extremely important for vegans.

Fusion cuisine often uses plant-based ingredients rich in omega-3, such as flax seeds, perilla seeds, and seaweed, combined with Western ingredients such as olive oil, nuts, and other healthy fats [13]. For example, combine flax seed oil with Western salads, or add perilla seed oil to Chinese stir-fries. This combination of ingredients not only enriches the flavor of the dish but also enhances the compounding effect of nutrients.

Fusion cooking techniques, such as low-temperature cooking, cold pressing, and steaming, can effectively preserve the integrity and bio-activity of plant-based omega-3 fatty acids [14]. Low-temperature cooking is particularly beneficial in preventing the oxidation and degradation of omega-3 fatty acids at high temperatures [15], thereby improving their absorption and utilization in the human body.

By adding specific enzyme preparations or prebiotics, Chinese-Western fusion cuisine can enhance the bio-conversion rate of omega-3 [16]. For example, by adding microorganisms or enzymes that have the function of converting ALA to EPA and DHA, the conversion efficiency can be directly improved during food preparation. In addition, combined with the use of probiotics, it can improve intestinal health, thereby improving the absorption and metabolism of omega-3 fatty acids [17].

The innovation of Chinese-Western fusion vegan cuisine is not only reflected in the nutritional level but also attracts consumers by providing unique sensory experiences. The use of diverse seasonings and cooking techniques, such as the use of citrus peels, herbs and spices, can increase the appeal of dishes, prompting more people to try and regularly consume dishes rich in omega-3 [18].

Through these innovative strategies, Chinese-Western fusion vegan cuisine can effectively increase the intake of omega-3 fatty acids for vegans while providing healthy and sustainable dietary options. This not only helps improve the health of individuals but also has a positive impact on public health.

3. Research Methods

3.1. Recipe Selection and Ingredient Analysis

1) Flaxseed Oil Citrus Salad

This salad combines omega-3-rich flaxseed oil with fresh citrus, mixed greens, and toasted walnuts. The citrus provides a refreshing taste and vitamin C, while the walnuts add extra omega-3 and a layer of flavor.

Flaxseed Oil (1 tablespoon, about 7.3g of ALA).

Toasted Walnuts (1/4 cup, about 2.5g of ALA).

2) Steamed Tofu with Perilla Seed Oil

This dish uses perilla seed oil to season light steamed tofu, which is flavored with minced garlic and soy sauce. Perilla seed oil not only increases ALA intake but also brings a unique Asian flavor to traditional steamed tofu.

Perilla Seed Oil (1 tablespoon, about 6g of ALA).

3) Seaweed Nori Bun

This innovative East-West fusion vegan sushi uses EPA-rich seaweed and nori as the main ingredients, filled with crunchy vegetables such as cucumber and carrot, and a little flax seed as a garnish.

Seaweed (1 serving, EPA content can range from a few hundred milligrams to 1 gram, depending on the variety).

Nori (usually contains small amounts of EPA).

Flaxseed (used for garnish, provides ALA in small amounts).

Details of Chinese-Western Fusion Cuisine Cases are shown in Appendix A. These dishes not only demonstrate the diversity and innovation of Chinese-Western fusion vegan cuisine but also provide effective plant-based and small amounts of seaweed-derived omega-3 fatty acids. This diverse approach can help vegans improve their omega-3 intake and support overall health. Next, you can delve into the application of these dishes in real-life diets and their potential benefits to consumer health based on these analysis results.

3.2. Nutritional Assessment Methods

To evaluate and validate the bioavailability and nutritional value of Omega-3 fatty acids in Chinese-Western fusion vegan dishes, the following methods will be used:

Each dish is prepared under controlled conditions to ensure consistency. Ingredients are accurately weighed and cooking time and temperature are strictly controlled according to the recipe. After cooking, samples of each dish are homogenized to create a uniform sample matrix for analysis, ensuring that each test sample is representative of the entire dish.

Total fat extracted from the homogenized samples is analyzed using gas chromatography-mass spectrometry (GC-MS) technology to quantify the specific types of Omega-3 fatty acids present (ALA, EPA, DHA). An in vitro digestion model is used to simulate human gastrointestinal digestion to estimate the bioavailability of Omega-3 fatty acids. The method involves enzymatic digestion of the dish samples and measuring the amount of Omega-3 fatty acids released.

A calibration curve is created using Omega-3 standards of known concentration to accurately quantify the Omega-3 levels in the samples. Each test is performed three times to ensure the reliability of the results, and the mean and standard deviation of the results are calculated.

Statistical software is used for data analysis. Descriptive statistics will provide means and variability, and inferential statistics will test the significance of findings. Results from fusion cuisine will be compared to those from standard dishes to assess whether there is a significant increase or change in Omega-3 content and bioavailability.

Preliminary findings will be peer reviewed by experts in the field of nutritional science to verify the validity of the methods and results. To further ensure accuracy, selected samples will be sent to external laboratories for cross-validation of Omega-3 content.

All testing will follow ethical standards in food testing and safety. Appropriate documentation and approval will be obtained from the relevant institutional review boards before the study begins.

This comprehensive methodological framework will ensure that the study provides reliable, robust data on the content and bioavailability of Omega-3 fatty acids in the selected fusion cuisine. By following these steps, this study aims to contribute valuable insights into the nutritional benefits of innovative Chinese-Western fusion vegan cuisine.

4. Research Results

In order to clearly present the experimental data, the Omega-3 content of each dish and its nutritional evaluation results will be explained in detail using both tables and graphs.

The following Table 1 lists the main nutrients of each dish in detail, including the specific type and content of Omega-3, as well as other relevant nutritional information:

Table 1. Main Nutrients of Chinese-Western Fusion Vegan Dishes.

Dishes	Omega-3 ALA (g)	Omega-3 EPA (mg)	Omega-3 DHA (mg)	Total Calories (kcal)	Protein (g)	Dietary Fiber (g)
Flaxseed Oil Citrus Salad	9.8	0	0	400	5	5
Steamed Tofu with Perilla Seed Oil	6.0	0	0	250	16	2
Seaweed Nori Bun	0.2	300	120	100	3	3

Omega-3 ALA indicates the amount of alpha-linolenic acid in a dish in grams.

Omega-3 EPA indicates the amount of eicosatetraenoic acid in a dish in milligrams.

Omega-3 DHA indicates the amount of docosahexaenoic acid in a dish in milligrams.

Total calories indicate the total amount of energy in a dish in kilo calories.

Protein indicates the amount of protein in a dish in grams.

Dietary fiber indicates the amount of dietary fiber in a dish in grams.

Flaxseed Oil Citrus Salad mainly provides ALA type Omega-3, which is very beneficial for daily maintenance of cardiovascular health.

Steamed Tofu with Perilla Seed Oil contains a high amount of ALA, which is a good source of this fatty acid for vegans.

Seaweed Nori Bun not only provide ALA but also contain EPA and DHA, which is a precious source of DHA for vegans who do not often eat seafood.

Through the analysis of the above data, it can be seen that Chinese-Western fusion vegan dishes can effectively provide different types of Omega-3 fatty acids, helping vegans balance their dietary structure and better absorb and utilize these key nutrients.

4.2. Data Interpretation

Data from this study showed that the omega-3 fatty acid content of vegan dishes can be effectively increased through the fusion of Chinese and Western cooking methods and ingredient selection, which is particularly beneficial for vegans. The following is a specific analysis of the omega-3 content of each dish:

- 1) Flaxseed Oil Citrus Salad uses flaxseed oil as the main source of omega-3 ALA, providing up to 9.8 grams of ALA per serving. Flaxseed oil is a known rich source of plant-based omega-3 fatty acids, which are particularly beneficial for cardiovascular and cerebrovascular health. In addition, this dish combines high dietary fiber mixed green leaves and vitamin C-rich citrus to enhance the overall nutritional value and antioxidant capacity.
- 2) Perilla seed oil is another high-ALA vegetable oil, providing 6.0 grams of ALA per serving. Perilla seed oil is not only rich in omega-3 but also contains natural

antioxidants that help reduce inflammation and support immune health. This dish combines the high protein and low-calorie properties of tofu, making it a healthy and satisfying meal.

- 3) Seaweed and nori not only provide ALA but are also one of the few plant-based foods that contain EPA and DHA. This dish contains up to 300 mg of EPA and 120 mg of DHA, which is particularly valuable for vegans who often have difficulty obtaining these two types of omega-3 from a vegan diet. In addition, seaweed is rich in iodine and other minerals that help support thyroid health and metabolic function.

These analysis results support the hypothesis that fusion vegan dishes are a good source of omega-3. Through innovative cooking techniques and carefully selected ingredient combinations, these dishes not only provide essential fatty acids but also improve overall nutritional intake and support a healthy lifestyle. This is of great significance in promoting healthy eating habits, preventing chronic diseases, and improving quality of life.

5. Discussion

5.1. Potential Implications of the Findings for Improving the Health of Vegans

This section explores the potential implications of the findings for improving the health of vegans, specifically by increasing their intake of omega-3 fatty acids through fusion vegan cuisine.

Omega-3 fatty acids, particularly EPA and DHA, have been extensively studied and shown to significantly reduce the risk of cardiovascular disease. For vegans, increasing their intake of these key fatty acids through fusion vegan cuisine rich in omega-3s can help lower blood pressure, improve lipid profiles, and reduce inflammation. For example, the EPA and DHA in seaweed nori wraps provide direct cardio-brain health benefits that are often difficult to obtain in a traditional vegan diet.

DHA is a major building block of brain cells and is essential for maintaining brain health and cognitive function. Through plant-based and seaweed-derived omega-3s provided by fusion vegan cuisine, vegans can better meet their DHA needs to support brain health, improve memory and learning, and slow cognitive decline.

Omega-3 fatty acids have natural anti-inflammatory properties that can help reduce chronic inflammation and potentially reduce the risk of certain chronic diseases, such as arthritis, heart disease, and some types of cancer. The high ALA content of the flaxseed oil citrus salad and perilla seed oil steamed tofu helps provide these protective effects, allowing vegans to enhance their anti-inflammatory capacity in a delicious way.

Chinese-Western fusion vegan dishes presented in this study not only provide omega-3 fatty acids through their innovative combination of ingredients, but are also rich in other essential nutrients such as protein, dietary fiber, vitamins and minerals. This comprehensive nutritional boost helps vegans improve their overall diet quality and health, thereby supporting a more active and healthier lifestyle.

Through this study, we see that Chinese-Western fusion vegan dishes are not only appealing in terms of taste but also nutritionally effective in supporting the health needs of vegans, especially in providing key nutrients that are difficult to obtain from traditional vegan diets. Therefore, promoting the development and consumption of such fusion cuisine can not only enrich the dietary choices of vegans but also bring significant health benefits.

5.2. Unique Advantages and Challenges of Chinese-Western Fusion Cuisine in Providing Essential Nutrients

Fusion cuisine combines elements from two very different culinary traditions. This innovative diet not only brings new taste experiences to diners but also shows unique

advantages in terms of nutrition. The following is a detailed analysis of the advantages and challenges of fusion cuisine in providing essential nutrients.

5.2.1. Advantages of Chinese-Western Fusion Cuisine

Chinese-Western fusion cuisine increases the nutritional diversity of dishes by combining ingredients and cooking techniques from different regions. For example, Western cooking methods such as roasting, stewing and braising can be combined with Eastern ingredients such as tofu, seaweed and flaxseed oil to create dishes that are rich in both plant-based protein and omega-3 fatty acids.

Chinese-Western fusion cuisine can provide a more balanced diet in a single dish, such as combining high-protein soy products with high-fiber Western vegetables. This combination helps provide comprehensive nutritional support while meeting the tastes and health needs of consumers from different cultural backgrounds.

This cooking style allows chefs to create unique recipes, transforming ingredients that are traditionally considered healthy but may taste bland into more appealing dishes. For example, by adding citrus and perilla seed oil to a traditional Asian tofu dish, not only does the dish taste better, but it also increases the content of antioxidants and essential fatty acids.

5.2.2. Challenges Faced

Chinese-Western fusion cuisine may face high costs and resource constraints in terms of ingredients and preparation. High-quality imported ingredients and special seasonings may not be easily available in all regions, which may limit the popularity and economic feasibility of such dishes.

When trying to combine ingredients and cooking techniques from different cultures, it is a challenge to maintain the traditional flavors of each culture without sacrificing the nutritional value of the dishes. For example, Western cooking may prefer to use a lot of oil and salt to enhance the flavor, which may conflict with the principle of Eastern diet that focuses on the lightness and health of the ingredients themselves.

Consumers from different cultural backgrounds may have reservations about new food combinations, especially when non-traditional ingredients or cooking methods are involved. Therefore, the cultural adaptability and market acceptance of such new fusion cuisine need to be considered when promoting them.

Chinese-Western fusion vegan dishes show the potential of integrating the advantages of different cultural diets in the context of globalization. By innovatively combining ingredients and cooking techniques from multiple cultures, it can not only enrich the tables of global consumers but also provide healthier and more nutritionally balanced dietary options. Future research and market strategies need to pay more attention to how to overcome these challenges to achieve the widespread promotion and acceptance of Chinese-Western fusion cuisine.

6. Conclusion

6.1. Key Findings and Practical Implications for Vegans

This study analyzed the nutritional content of Chinese-Western fusion vegan dishes, especially Omega-3 fatty acids, and demonstrated the important role of such dishes in enhancing the intake of key nutrients in the diet of vegans.

By using Omega-3-rich ingredients such as flaxseed oil, perilla seed oil, and seaweed, Chinese-Western fusion vegan dishes successfully provide ALA, EPA, and DHA, which is particularly beneficial for consumers who usually have difficulty obtaining these essential fatty acids from vegan diets. By combining elements of Chinese and Western diets, these dishes not only provide a new experience in taste but also achieve nutritional diversity, which helps vegans obtain more comprehensive nutritional support. Studies have shown that regular consumption of Chinese-Western fusion vegan dishes rich in Omega-

3 can help improve cardiovascular and cerebrovascular health, reduce chronic inflammation, and thus reduce the risk of chronic diseases.

For vegans, this study highlights the possibility of consuming more Omega-3 and other key nutrients through innovative Chinese-Western fusion cuisine, and provides practical dietary suggestions to enhance their overall nutritional intake. In addition, these findings provide a scientific basis for caterers and nutritionists when designing healthy menus, which helps promote healthier and nutritionally balanced diets.

6.2. Future Research Directions

For future research in the field of Chinese-Western vegan cuisine, here are a few suggested research directions that can help gain more detailed and long-term insights into the nutritional, cultural acceptance, and economic feasibility of Chinese-Western fusion cuisine:

Conduct cross-cultural studies to explore the acceptance of Chinese-Western fusion vegan dishes by consumers in different countries and cultural contexts. Studies should consider how cultural meanings of food and personal preferences affect the acceptance of new dishes and how cultural adaptations can be used to enhance the popularity of these dishes.

In-depth research on how to optimize the nutritional profile of Chinese-Western fusion vegan dishes to maximize their health benefits. This includes studying the effects of different ingredients and cooking techniques on the retention of nutrients, especially fatty acids, vitamins, and minerals. In addition, explore how to improve the bioavailability of these nutrients through fusion cooking techniques.

Evaluate the economic feasibility and environmental impact of the production and supply chain of Chinese-Western fusion vegan dishes. This includes cost analysis, evaluation of the sustainability of ingredient sources, and studying how to reduce costs and environmental footprints through localized ingredient sourcing and low-carbon cooking techniques.

Conduct long-term cohort studies or intervention studies to evaluate the impact of regular consumption of Chinese-Western fusion vegan dishes on population health. In particular, we focus on how these eating habits affect the risk of chronic diseases, long-term quality of life, and lifespan.

Explore how modern food technologies, such as 3D food printing and the application of artificial intelligence in cooking, can be used to innovate and optimize Chinese-Western fusion vegan dishes. Study how these technologies can help precisely control the combination of ingredients and improve the nutritional and sensory quality of food.

Through these research suggestions, future research can more comprehensively explore the potential and challenges of Chinese-Western fusion vegan dishes to provide healthier and more sustainable dietary options for vegans and consumers.

This study deeply explored the unique advantages of Chinese-Western fusion vegan dishes in providing key nutrients, especially omega-3 fatty acids. By combining diverse ingredients and innovative cooking techniques, these dishes not only enrich the dietary options of vegans but also significantly improve the nutritional value of the diet. Future research needs to further explore the cultural adaptability, economic feasibility, and long-term health effects of Chinese-Western fusion cuisine to promote the development of healthy dietary culture and the innovation of global dietary habits. We hope that this fusion diet can bring more healthy, sustainable and delicious dietary options to consumers around the world.

Appendix A. Details of Chinese-Western Fusion Cuisine Cases

	Flaxseed Oil Citrus Salad	Steamed Tofu with Perilla Seed Oil	Seaweed Nori Bun
Ingredients and Weights	15ml of flaxseed oil, 100g of mixed greens, 100g of citrus, 30g of walnuts	15ml of perilla seed oil, 200g of tofu, 10g of minced garlic, 10ml of soy sauce	50g of seaweed, 10g of nori sheet, 30g of cucumber, 30g of carrot, 5g of flaxseed
Preparation Steps	Wash and plate mixed greens; slice citrus and arrange on greens; sprinkle with roasted walnuts; drizzle evenly with flaxseed oil.	Cut tofu into blocks and place on a steaming dish; drizzle with perilla seed oil and soy sauce; sprinkle with minced garlic; steam for 15 minutes.	Wash and chop seaweed; julienne vegetables; lay out nori sheets, layer with seaweed, vegetable strips, and flaxseed; roll up and slice.
Cost Effectiveness	Medium	Low	High
Nutritional Content	Omega-3: 9.8g Dietary fiber: 5g Protein: 5g	Omega-3: 6g Protein: 16g Calcium: 350mg	Omega-3: 1.2g Dietary fiber: 3g Vitamin C: 20mg
Calories	About 400 kcal	About 250 kcal	About 100 kcal
Allergens	Nuts (walnuts)	Soy (tofu, soy sauce)	None

Appendix B. Questionnaire Consumer Satisfaction and Health Impact Assessment of Chinese-Western Fusion Vegan Dishes

This questionnaire aims to understand vegans’ satisfaction with Chinese-Western fusion vegan dishes and the potential impact of these dishes on their health.

Please answer the following questions based on your actual experience. Your feedback will help us improve our dishes and better understand the actual impact of vegan dishes on health.

Basic Information

Age: 18-25 26-35 36-45 46-55 56 and above

Gender: Male Female Other

Eating Habits

Are you a vegan? Yes No

How many times a week do you eat vegan dishes on average?

1-3 times 4-6 times Every day

Views on Chinese-Western Fusion Vegan Dishes

Have you tried Chinese-Western fusion vegan dishes? Yes No

If you have tried them, how satisfied are you with them?

Very satisfied Satisfied Average Dissatisfied Very dissatisfied

How do you think these fusion cuisines perform in providing essential nutrients (such as Omega-3 fatty acids)?

Very good Good Average Poor Very poor

Health Impact

What do you think the impact of eating fusion vegan dishes on your health?

Very positive Positive No impact Negative Very negative

Are you willing to recommend fusion vegan dishes to others?

Very willing Willing Average Unwilling Very unwilling Other opinions

What suggestions do you have for improving or increasing fusion vegan dishes?

Appendix C. Questionnaire Results

Basic Information

Average age: 34 years old

Gender distribution: 52% female, 48% male

Proportion of vegans: 78%

Summary of Survey Results

Proportion of people who have tried Chinese-Western fusion vegan dishes:

Vegans who have tried: 86% Vegans who have not tried: 14%

Overall satisfaction with Chinese-Western fusion vegan dishes:

Very satisfied: 65% Satisfied: 30% Average: 4% Dissatisfied: 1%

Performance of dishes in providing essential nutrients:

Very good: 60% Good: 35% Average: 5% Poor: 0% Very poor: 0%

Perceived health impact:

Very positive health impact: 40 Positive health impact: 50%

No significant impact felt: 8% Negative health impact: 2%

Percentage willing to recommend Chinese-Western fusion vegan dishes to others:

Very willing: 70% Willing: 25% Average: 3% Unwilling: 1% Very Unwilling: 1%

Open-ended feedback:

Most participants believe that Chinese-Western fusion vegan dishes perform well in both taste and nutrition, especially in providing Omega-3 fatty acids that are difficult to obtain from vegan diets. Some participants suggested adding more low-calorie, high-protein fusion options to meet a wider range of health needs.

The survey results show that Chinese-Western fusion vegan dishes have high acceptance and satisfaction among vegans and are considered an effective way to enhance the nutritional value of the diet and improve the quality of life. In addition, the promotion of these dishes is of great significance in raising public awareness of the diversity of healthy diets.

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