Food styling and food photography with generative AI[1]

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ABSTRACT

The objective of this study is to evaluate the aesthetic suitability of generative AI food images and to examine the potential role of AI in food styling and photography, including its strengths, weaknesses, opportunities, and threats. In this research, eight dishes from Turkish cuisine, Imambayıldı and Zeytinyağlı enginar (artichoke with extra virgin olive oil) for the olive oil theme, Adana kebab and Hünkâr beğendi for the main course theme, fırında sütlaç (baked rice pudding) and pumpkin dessert for the dessert theme, çay (Turkish tea) and Turkish coffee for the beverage theme, were produced separately using Adobe Firefly 3 and DALL-E 3 Artificial Intelligence (AI) applications. Real food photographs were also included for comparison. Thirty-one professional food stylists and photographers volunteered and participated in the study. Consequently, a total of 24 food images were created and evaluated by professionals according to six aesthetic criteria: lighting, color, composition, presentation, appropriateness of the props and background, and the creation of a mouth-watering sensation. The findings reveal no significant difference between the food photographs produced using the AI 1 application and real food photographs. Half of the images created by the AI 2 application also showed no significant differences compared to real images. However, significant differences were observed in five images between the two AI applications. Participants highlighted low costs, fast production, and flexibility as strengths of AI applications in food styling and photography. Conversely, weaknesses included the production of surreal images and aesthetic concerns. Opportunities were identified in fostering innovation, creativity, and new perspectives, while potential threats involved ethical and copyright concerns, overdependence on AI tools, and potential job displacement.

KEYWORDS

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[1]. Ethical approval was given by the Ankara Hacı Bayram Veli University Ethics Commission on 17.07.2024, with the number 280014.
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INTRODUCTION

Food styling and food photography, which form an integral part of the culinary arts, engage many neurological and cognitive perceptions of the human brain, including those related to vision, taste, smell, hearing, and touch (Gambetti & Han, 2022). Visually appealing food photography is not limited to a single field; instead, it is employed in many contexts, including education, the food and beverage industry, social media, gastronomic tourism, advertising, and promotional activities (Custer, 2010).

In the contemporary era, the utilization of Artificial Intelligence (AI) is becoming increasingly prevalent across a multitude of domains, particularly in the realms of education, healthcare, and service-oriented jobs (Denecke et al., 2023; Sperlich et al., 2023; Zaman, 2023; Rony et al., 2024), production of educational content (Greif et al., 2024), innovation (Mingjing, 2024) and finance (Burger et al., 2023). Simultaneously, food styling and visualization have undergone significant advancements driven by the integration of AI technologies.

Food styling and photography represent a complex and highly specialized discipline. It is anticipated that generative AI will facilitate this visual art, enabling faster and more innovative production of creative visual content. Generative AI offers gastronomy researchers a unique perspective on the following questions: "Can AI-generated visuals achieve hyper-realistic effects if light, color, composition, presentation, and the relationship between subject and background are accurately rendered?" "Can these images be distinguished from real photographs?" "Is it possible to produce reliable and valid AI-generated content?" "How can AI support professionals working in visual gastronomy?"

Aesthetics is a field of philosophy that examines concepts and questions associated with the arts, architecture, and design (Brady & Prior, 2020) and is typical to identify beauty (Padenet al., 2013). Aesthetic theory teaches us that mental pleasure may be stimulated by natural, artistic, and moral beauty (Sisti et al., 2021). Aesthetic evaluation is a challenging process, and there is no consensus on the criteria that should be used (Conolly & Haydar, 2003). The aesthetic criteria used in evaluating food photographs in the research are adapted from the works of professional food stylists and photographers already working in this field. The aesthetic criteria employed in the study can be listed as follows: the utilization of light, the selection of an appropriate color for the background of the figure, composition, presentation, the choice of appropriate props and background, and the creation of a sensation of a mouth-watering nature (Custer, 2010; Dujardin, 2011; Young, 2011; Gambetti & Han, 2022).

This study evaluates AI-generated and real food images based on these aesthetic criteria by food styling and photography professionals. Its objective is twofold: first, to assess the aesthetic compliance of AI-generated food images as perceived by a panel of expert food photographers utilizing established aesthetic criteria; second, to analyze the potential implications of AI in this field, examining its strengths, weaknesses, opportunities, and threats.

CONCEPTUAL FRAMEWORK

Although the foundations of food styling and photography can be traced back to the 1950s, it has become a popular field of study and practice, particularly since the 2000s (Cankul et al., 2021). Researches show that the visual composition of the food on the plate affects people's thoughts about the food (Michel et al., 2015). Designing foods with visual aesthetic elements increases people's tastes and affects their consumption behavior (Michel et al., 2014). Food styling can be summarized as the art of preparing food for the camera, and the food stylist prepares food to feed the eyes and the imagination (Custer, 2010). Food photographs give people more satisfying experiences through emotions such as entertainment, personal identity, and social interaction (Liu et al., 2012). The domain of food photography is a synthesis of compositional techniques, stylistic approaches, creative expression, and conceptual inquiry (Dujardin, 2011). Food photography aims to evoke the perception of flavor in food visuals by engaging all five senses of the human being (Young, 2011). The stylization and visualization of food and the photography of visuals appeal to people's cognitive perception and increase their aesthetic appreciation.

Generative AI is a technological approach that uses computational techniques to create novel and meaningful content based on relevant datasets, including text, visuals, and audio

(Feuerriegel et al., 2024). The latest technological advances have enabled AI to be utilized in various fields (Değerli & Tatlısu, 2023). AI applications such as Dall-E 3, OpenAI ChatGPT, Microsoft CoPilot, and Google Gemini facilitate human-information interaction. While the use of generative AI is also developing in the domain of food and beverage (Kumar et al., 2021), AI tools facilitate the creation of visuals through the use of prompts (Kolides et al., 2023).

AI tools have been increasingly utilized in gastronomy, with several studies highlighting their diverse applications. Examples include development of a food aesthetic evaluation model (Gambetti & Han, 2022), recipe invention (Şener & Ulu, 2024), formulation of nutritional recommendations (Ponzo et al., 2024), development of dietary recommendations for individuals with food allergies (Niszczota & Rybicka, 2023), menus designs (Khan & Hoffmann, 2003) and creation of vegetarian menus (Göktaş, 2023). Ulu (2024) also demonstrated using Bing Image Creator to generate food images. Despite these advancements, studies focusing specifically on food styling and photography remain scarce in the existing literature.

METHODOLOGY

This research employs a mixed-methods approach, combining both quantitative and qualitative methodologies. The quantitative component evaluates differences among 24 food images based on aesthetic criteria. In contrast, the qualitative component utilizes a case study design to analyze the demographics of the participants as well as the strengths, weaknesses, opportunities, and threats (SWOT) of AI usage interview questions in food styling and photography. Content analysis was used to process qualitative data. The objective of qualitative research is to gain an understanding of the subject under investigation (Haradhan, 2018). The case study design allows for analyzing a situation, event, action, or process (Merriam & Tisdell, 2015).

The research universe was expert food stylists and photographers in Türkiye. The sample was designed as a non-random, purposeful, typical sample (Baştürk & Taştepe, 2013) from thirty-one volunteer food stylists and photographers who were deemed the most appropriate for the research. The data collection occurred between July 18, 2024, and August 23, 2024. The number of participants in a sampling process can range from 10 (Sandelowski, 1995) to 30 (Boddy, 2016), with 20-30 participants typically used in grounded theory and 15-30 participants used in case studies. It was presumed that the study participants possessed the requisite knowledge and equipment to engage with the subject matter of food styling, aesthetics, and visual arts.

The research used Adobe Firefly 3 and OpenAI Dall-E 3 as AI visual development tools. AI images were created by using a prompt. For instance, in the context of the dessert theme, the AI was initially queried about Turkish desserts. Subsequently, the definition of a baked rice pudding dessert was requested. The AI system was then instructed to generate a visual representation based on the provided prompt. The final sample prompt was as follows;

"A photograph of fırında sütlaç, or Baked Rice Pudding, is required. This Turkish dessert is prepared with rice, milk, sugar, and is baked in the oven until a golden, caramelized layer form on the surface. The top layer should be caramelized. This dessert is renowned for its creamy texture and delicate sweetness. It should be served in a small clay pot with small pieces of walnut on top. The dish should be placed on a blue table with a small spoon next to it. The upper right corner should contain a glass of Turkish tea".

Later, the use of AI in producing food images was combined with the input of real artists, and the resulting images were then subjected to expert evaluation to enhance the reliability of the research process. The aesthetic evaluation criteria employed were correct use of light (natural, at the right angle), suitable color on the figure background (color harmony, brightness, contrast, clarity, natural colors), composition (story, main theme, appropriate clarity, balanced and organized according to the rules of composition), presentation (size, texture, theme, portioning, realism, naturalness, freshness and garnish), suitable prop and ground, and mouthwatering, sensation of eating (appetizing, attractive, including details) (Custer, 2010; Dujardin, 2011; Young, 2011; Gambetti & Han, 2022). In addition, two expert photographers were consulted to validate the criteria.

Aesthetic evaluation criteria for food photographs are shown in Table 1. Consequently, eight dishes were selected based on four themes: olive oil dishes, main course, dessert, and beverage. For each of these eight foods, images were created using AI Tool 1 (AIT1), AI Tool 2 (AIT2), and real photographs, resulting in a total of 24 images being evaluated. Visual content was presented without disclosing whether it was AI-generated or real to ensure unbiased evaluations. While the limited number of real and AI-generated visuals can be considered a limitation, this decision was made to accommodate the time commitment required from volunteer expert evaluators. Additionally, the perspectives of expert photographers on the use of AI in food styling and photography were explored through the following interview questions: "What are the strengths, weaknesses, opportunities, and threats of using generative AI in food styling and photography?" The collected data were analyzed using content analysis techniques.

Table 1.

Aesthetic Evaluation Criteria (AEC) (Source: adapted from Custer, 2010; Dujardin, 2011; Young, 2011; Gambetti & Han, 2022)

#	Criteria	Bad							Good		
		1	2	3	4	5	6	7	8	9	10
AEC1	Correct use of light	1	2	3	4	5	6	7	8	9	10
AEC2	Suitable color on the figure background	1	2	3	4	5	6	7	8	9	10
AEC3	Composition	1	2	3	4	5	6	7	8	9	10
AEC4	Presentation	1	2	3	4	5	6	7	8	9	10
AEC5	Suitable prop and ground	1	2	3	4	5	6	7	8	9	10
AEC6	Mouthwatering, sensation of eating	1	2	3	4	5	6	7	8	9	10

Ethical approval for the study was obtained from Ankara Hacı Bayram Veli University on July 17, 2024 (approval no. 280014). All participants provided informed consent. Participant anonymity was maintained by coding responses with unique identifiers (e.g., P1, P2, …, P31).

FINDINGS AND DISCUSSION

Demographic Information of the Participants

The demographic characteristics of the 31 food stylists and photographers who participated in the study are presented in Table 2. The participants had an average age of 45.4 years and an average professional experience of 19.9 years. Educational qualifications included undergraduate degrees for 58.0% of participants, followed by graduate degrees (32.3%). Geographically, participants were based mainly in Istanbul and Ankara (51.6% and 32.2% respectively).

Table 2.

Demographic Information of the Participants in the Study

Participants	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Age	56	40	45	44	42	58	35	33	48	53	49	41	46	48	37	46	48	40	42	49	39	42	43	54	50	43	54	47	50	40	44
Education*	U	U	U	G	U	U	U	G	G	H	U	G	G	G	U	U	E	U	U	U	U	U	U	G	G	U	G	U	U	H	G
Experience(y)	30	15	27	10	19	30	15	10	19	22	24	18	13	30	14	11	30	20	17	24	15	20	14	30	30	13	28	16	19	25	8
City**	A	I	I	I	Be	A	A	A	N	I	A	A	I	A	Bu	I	I	I	A	A	E	I	I	I	I	A	I	I	I	Iz	I

*U: Undergraduate, G: Graduate, H: Highschool, E: Elementary

**A:Ankara, Be: Berlin (Germany), Bu: Bursa, E: Eskişehir, I: Istanbul, Iz: Izmir, N: Newyork (USA)

Evaluation of generative AI usage from the perspective of food stylists and food photographers

Participants assessed the food photographs based on the aesthetic criteria outlined in Table 1. Three groups of photographs represented each dish: AI Tool 1 (AIT1), AI Tool 2 (AIT2), and real images. AI-generated food images were created using prompts. A total of 24 food images were then presented to professionals for evaluation, with no indication provided as to whether the images were AI-generated or real.
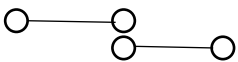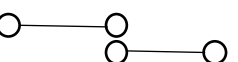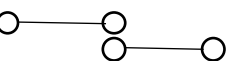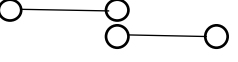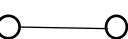
The dishes to be evaluated were compiled from the book Turkish Cuisine with timeless recipes (Eker, 2020). The selected dishes were as follows: İmambayıldı and zeytinyağlı enginar (artichoke with olive oil) for the olive oil theme, Adana kebab and Hünkâr beğendi for the main course theme, fırında sütlaç (baked rice pudding) and pumpkin dessert for the dessert theme, çay (Turkish tea) and Turkish coffee for the beverage theme.

İmambayıldı is a beloved Turkish dish known for its rich flavors and aromatic ingredients. It is a dish cooked with onion, green pepper, tomato, garlic, and olive oil in aubergines and served cold (Oktay & Guden, 2021). Zeytinyağlı enginar (artichoke with olive oil) is a popular and refreshing dish in Turkish cuisine, particularly during spring and summer, served cold. Adana kebab is widely regarded as one of the most delicious and famous varieties of kebab in Turkish cuisine. The specific *"Adana kebab"* designation is attributed to its historical provenance in Adana, Türkiye (Turkish foodie, 2024a). Hünkâr beğendi, or the dish known as *"Sultan's Delight,"* represents a classic example of Turkish cuisine, combining a rich, creamy aubergine purée with a tender lamb stew. This dish was thought to be a particular favorite of the Ottoman sultans (Turkish Foodie, 2024b). Fırında sütlaç (baked rice pudding) is a traditional Turkish dessert characterized by a creamy texture, subtle sweetness, and a golden crust. Kabak tatlısı (the pumpkin dessert) is a traditional Turkish confection comprising slow-cooked pumpkin slices sweetened with sugar and frequently garnished with crushed walnuts or tahini. Çay (Turkish tea) is a fundamental element of Turkish culture, widely recognized for its robust and complex flavor profile and distinctive deep red hue. It is traditionally served in small tulip-shaped glasses. Turkish coffee is served with a glass of water on special occasions, holidays, and when neighbors visit (Karhan, 2021). It is very finely grounded.

A series of statistical tests were conducted to ascertain whether there is a significant distinction between food photographs created with the assistance of AI and those captured using conventional methods. The initial step assessed whether normalization had been applied for each of the eight foods, as the sample size exceeded thirty. Normality tests were conducted using the statistical software package SPSS. Firstly, the Kolmogorov-Smirnov or Shapiro-Wilk normality tests were conducted, after which the skewness and kurtosis values were evaluated (Ghasemi & Zahediasl, 2012). The Kolmogorov-Smirnov or Shapiro-Wilk normality tests yielded statistical Sig. ($p > 0.05$) The eight food photographs indicate that the samples can be considered normally distributed. Furthermore, the data revealed that the skewness and kurtosis values for each food type fell within the range of -1.5 to +1.5 (Tabachnick & Fidell, 2013).

The Repeated Measures ANOVA method was employed since the samples were normally distributed (parametric test), and the differences between more than one group (Kul, 2014) in eight food types were analyzed. The results of the SPSS Repeated Measures ANOVA indicated that there was no significant difference between the AIT 1 samples, AIT 2 samples, and real food photographs for İmambayıldı(1), Zeytinyağlı enginar(2), and Hünkar beğendi(4) dishes (sphericity assumed sig. $p > 0.05$ and pairwise comparisons $p >= 0.05$). The results of the repeated measures ANOVA are presented in Table 3.

Table 3.
The "Repeated Measures ANOVA" of 24 (8X3) food photographs

Theme	Food class	Foods (n=8)	1-AIT 1 samples	2-AIT 2 samples	3-Real samples	Sphericity assumed sig.	Pairwise comp. (sig.)	Difference* x, n>m
Theme 1	Olive oil dishes	İmambayıldı (1)	x	x	x	< 0.235	1-2: <0.728 1-3: 1.000 2-3: <0.514	x (no significant difference)
		Zeytinyağlı Enginar (2)	x	x	x	<0.342	1-2: <0.673 1-3: 1.000 2-3: <0.845	x (no significant difference)
Theme 2	Main course	Adana kebab (3)	(means plot)	(means plot)	(means plot)	<0.001	1-2: <0.001 1-3: 1.000 2-3: <0.001	significant difference 2>1/ 2>3
		Hünkâr beğendi (4)	x	x	x	<0.067	1-2: 1.000 1-3: 0.050 2-3: <0.058	x (no significant difference)
Theme 3	Desert	Fırında Sütlaç (5)	(means plot)	(means plot)	(means plot)	<0.001	1-2: 0.040 1-3: 0.130 2-3: <0.001	significant difference 2>1/ 2>3
		Kabak tatlısı (6)	(means plot)	(means plot)	(means plot)	<0.001	1-2: <0.001 1-3: 1.000 2-3: <0.001	significant difference 2>1/ 2>3
Theme 4	Beverage	Çay (7)	(means plot)	(means plot)	(means plot)	<0.001	1-2: <0.001 1-3: 1.000 2-3: <0.001	significant difference 2>1/ 2>3
		Türk kahvesi (8)	(means plot)	(means plot)	x	<0.013	1-2: 0.039 1-3: 0.112 2-3: 0.578	significant difference 2>1

Difference*: x (no significant difference), n>m (n is more significant than m).

There was no significant difference between the AIT 1 samples and real food photographs. But there was a significant difference between AIT 2 and real food photographs (2>3) for Adana kebab(3), fırında sütlaç(5), kabak tatlısı(6) and çay(7) images. The aesthetic evaluation of the images produced with the two different AI applications revealed a significant difference in the images (2>1) of Adana kebab(3), fırında sütlaç(5), kabak tatlısı(6), çay(7) and Turkish coffee(8). The images produced with AIT2 were more meaningful than those produced with AIT1. Figure 1 illustrates the variations in the visual representation of food, as evaluated according to aesthetic criteria.
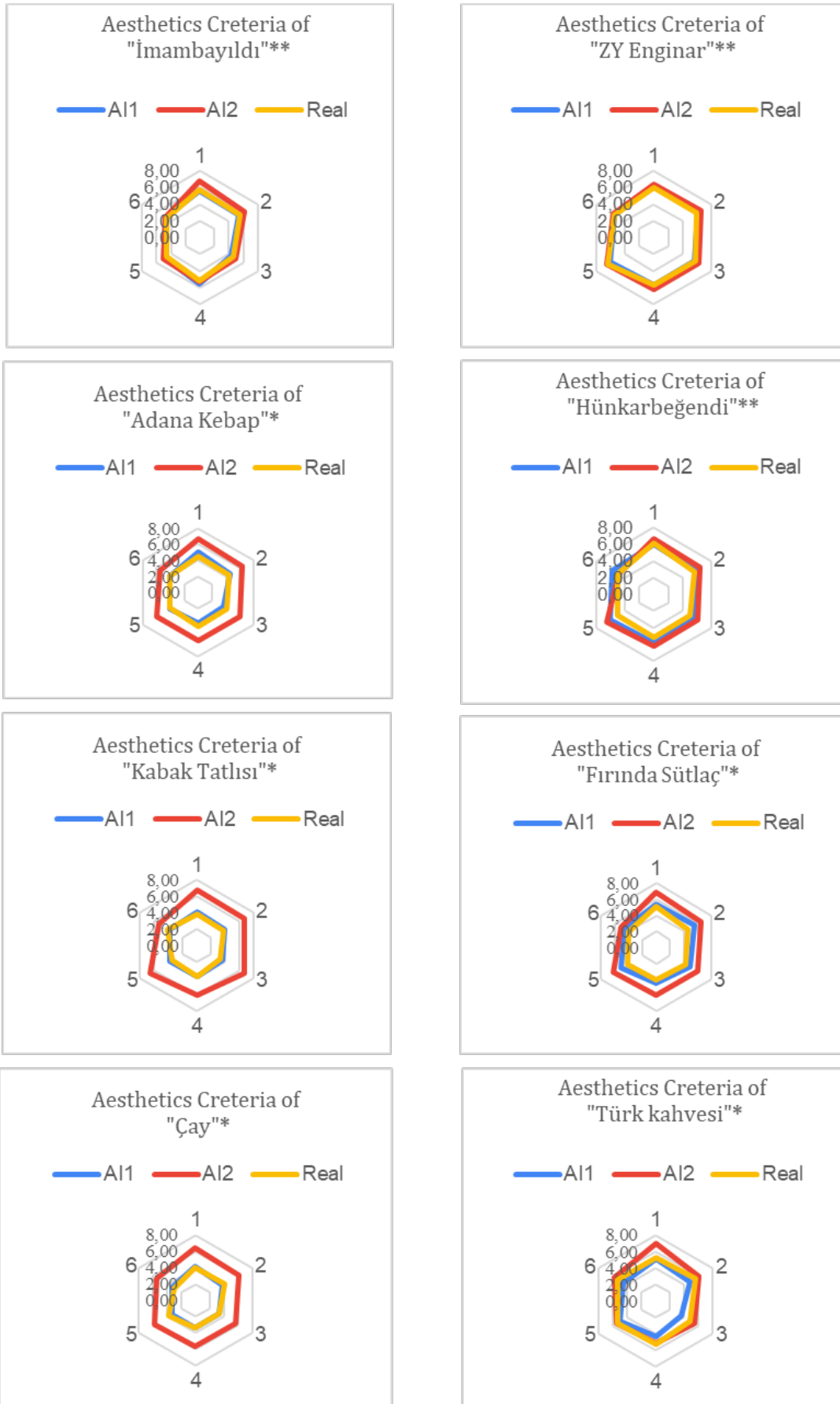
Figure 1. Radar Graphics of Food Photographs with Significant*/ No Significant Differences** (1-6 shows aesthetic evaluation criteria (AEC) in Table 1)

There is no significant difference in the images produced for all dishes between AIT 1 and real ones, and there is a significant difference of 50.0% of AIT2 images compared to real food photos. For example, visual illustrations of fırında sütlaç, which showed a significant difference, and imambayıldı, which showed no significant difference, are presented in Figure 2.

Fırında sütlaç (AIT 1)   Fırında sütlaç (AIT 2)   Fırında sütlaç (Real)

(Hakan Güleç archive)

İmambayıldı (AIT 1)   İmambayıldı (AIT 2)   İmambayıldı (Real)

(Hakan Güleç archive)

Figure 2. Food Photography of AIT 1, AIT 2 and Actual Fırında Sütlaç and İmambayıldı

SWOT Analyses of Using Generative AI in Food Styling and Food Photography

In the study, participants frequently identified the *"low cost"* of generative AI utilization in food styling and photography as a key strength. This was mentioned twenty-four times, representing 77.4% of the total participants. P4 states definitively that low-cost casting shoots are the way forward. Moreover, P4 says, *"We will no longer require an art director, studio, or model stylist in the near future."* The P10 is noted for being inspiring and providing high imagination for adverts. P20 also draws attention to the reduction of setup costs.

Among the weaknesses of generative AI in its use in food styling and food photography, the expression *'creating surreal images'* is the most common, with eighteen repetitions. This phrase corresponds to 58.1% of the participants. P3 points out the following weaknesses: *"Although the AI images produced comply with basic norms in terms of lighting and composition, the overly mathematical composition of the compositional set-ups and the overly artificial appearance of the dishes have negative consequences on appetite."* P17 says *"every chef's touch is different, so AI cannot fully replace food photography."* And P21 adds for the weakness *"perfect image of AI, surreal image is not convincing."* Tang (2023), in his study of AI, mentions that with AI, reality disappears, and a virtual world is created. Moreover, shares the concern of AI to manipulate public aesthetics. Bhattacharjee (2023), in his study of art and photography with AI, draws attention to the need for deep knowledge of software and technology. The weaknesses identified by the AI studies in the literature are consistent with the participants' statements. Table 4 illustrates the potential impact

of generative AI in food styling and photography, including an analysis of its strengths, weaknesses, opportunities, and threats.

Table 4.
The most commonly used expressions in the SWOT analysis of AI utilization in food styling and photography

Strengths	f *	Weakness	f *
Low-cost	26	Creating surreal images	18
Fast and flexible production	24	Aesthetic concerns	13
Rich content	14	Dependence on AI application maturity	13
Real/realistic image	12	Expertise in AI applications	10
Opportunities	f *	Threats	f *
New perspectives to educators, photography artists, and researchers	20	Copyright concerns	19
Innovativeness and creativity in visuals,	20	Ethical concerns	17
Helps gastronomy professionals in business life	17	Overdependence on AI applications	16
		Substitution of human labor	8

* f (frequency)

Participants used the phrase *"new perspectives for educators, photographic artists, and researchers"* and *"innovation and creativity"* 20 times to describe the opportunities of AI in food styling and food photography. This phrase of opportunities corresponds to 64.5% of the participants. For this, P21 and P25 state, *"All food photographers have a prop archive. In the future, we will use AI in props; we will not necessarily need an olive oil bottle. There will also be many options for the ground. It will definitely help to understand the light and increase creativity."* In addition, P29 adds that AI-powered drafts will help and make things easier. Gross (2024), in his analysis of AI in photography, highlights creativity and innovation among the opportunities. The techniques of the Generative Adversarial Networks (GAN) of AI allow photographers to create new images or combine several images (Marr, 2023). Professionals' new perspectives and innovative and creative statements overlap with AI studies in the literature.

Most repeatedly, 19 (%61.3) participants see AI as a threat to copyright. Ethical and moral concerns are expressed as the second major threat. P17 states, "impossible, fake dishes will be revealed". P14 adds, *"Very soon this will not be a business. No photographer will be needed."* Chen (2024), in his study on AI technology in photography and future challenges and reflections, draws attention to ethics, morality, copyright, and reduction in photography related jobs among the challenges. Gross (2024) also emphasizes that art production produced by AI should be managed ethically. Mingjing (2024) also sees AI's displacement of human jobs as a threat. Sperlich et al. (2023) cite an over-reliance on AI technology and less involvement of human expertise as a threat. The responses from participants that the use of AI in food styling and photography threatens ethics, morals, and copyright are similar to other AI threats in the literature.

CONCLUSION AND SUGGESTIONS
The findings of this study reveal that among the 24 food photographs evaluated based on aesthetic criteria, there was no significant difference between the AIT1 samples and real food photographs. Similarly, no significant difference was found for half of the AIT2 samples compared to real images. However, AIT2 images were more aesthetically meaningful than those produced by AIT1 in five cases. These findings support Cross's (2024) study that artificial intelligence can easily produce aesthetically pleasing images. Tang (2023) also states that AI can quickly produce visual photos. In their study on using AI in the kitchen, Califano et al. (2024) found no difference in confidence between AI and traditional recipes for standardized dishes. An analogous situation can be seen in food photography. In Califano and Spence's (2024) study evaluating the visual

appeal of real and AI-generated food images, it is stated that AI images are frequently preferred. However, the quality of images produced by different AI tools may vary depending on factors such as the richness of their libraries, their learning capabilities, and the level of detail in the prompts used. Although significant differences exist between AI-generated and real food images, no clear aesthetic superiority of one over the other has been established at this time.

In the research, participants emphasized that low cost, fast production, and flexible production are strong points when using AI in food photography. Weaknesses include surreal images, aesthetic concerns, dependence on the maturity of AI tools, and expertise in AI tools, respectively. For opportunities, new perspectives and innovative and creative approaches to food photography come to the fore. Among the threats, copyright, moral and ethical concerns, and over-dependence on AI tools are among the first. Another major threat in the future is job loss. According to research conducted by Goldman Sachs, the implementation of generative AI in the next decade is projected to increase global gross domestic product (GDP) by 7% and replace three hundred million knowledge-based jobs (Goldman Sachs, 2023).

The assessment of opportunities and threats presented by the utilization of AI for the creation of gastronomic visual content, coupled with an analysis of the strengths and weaknesses inherent to AI-driven visual production, has the potential to unlock new avenues of exploration for researchers engaged in this domain.

In the literature, it is seen that similar determinations are made for the use of AI technologies in areas such as information technology, education, healthcare, production, nutrition, and finance (Yıldırım & Yıldırım, 2022; Burger et al., 2023; Greif et al., 2024; Ponzo et al., 2024; Rony et al., 2024). Yavuz (2021) also states in his research that AI and machine learning will not need a camera in visual and photo production. Rich, fast, and flexible production and low cost confirm the findings in the literature.

However, ethical, moral, and aesthetic concerns are frequently expressed in fields such as art, where the concept of aesthetics comes to the fore. In the future, the use of AI is thought to be important in the field of food photography, but human creativity in art should not be ignored (Bhattacharjee, 2023).

Researchers can extend this study by exploring different food themes and employing alternative AI tools like OpenAI ChatGPT, Midjourney, or Anthropic AI. Furthermore, future studies could evaluate the impact of AI on our understanding of fine arts and aesthetics. Longitudinal, time-dependent research would also provide valuable insights into AI technologies' development and evolving capabilities.

In terms of its first theoretical impact, it can be stated that characterizing the aesthetic quality of real and AI-generated food images offers an innovative perspective for researchers working in the cognitive field with gastronomic experience in food styling. Secondly, from the perspective of food content creators, a SWOT analysis of AI images can be predicted to open new horizons for researchers.

In terms of its practical effect, it can be postulated that this will prompt all food professionals to consider their limits, thereby opening the doors of innovation and creativity for those engaged in the production of food visuals with aesthetic concerns, food and beverage operators, social media content producers, those working in the field of food advertising and marketing.

It is important to note that the research is subject to temporal constraints. Furthermore, the number of volunteer food stylists and photographers participating in the study in Türkiye represents a limitation. The AI tools employed are Adobe Firefly 3 and Google Dall-E 3, which represent a limitation.

It is important to acknowledge the limitations of this research. The study was conducted within specific temporal constraints, and the number of volunteer food stylists and photographers in Türkiye may represent a limitation. Additionally, the AI tools used, Adobe Firefly 3 and Google DALL-E 3, also impose constraints, as the findings may vary with different tools.

This study contributes to the growing literature on AI applications in gastronomy by comprehensively evaluating AI-generated food images and a SWOT analysis of their strengths, weaknesses, opportunities, and threats. By addressing the potential and challenges of generative

AI, the research highlights its transformative potential while advocating for responsible and ethical use. Future research should continue exploring AI's evolving role in creative and professional domains, emphasizing fostering collaboration between human creativity and machine efficiency.

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