Circular gastronomy – Exploring a new compound concept at the interface between food, meals and sustainability

Maria Nyberg\textsuperscript{a,c,}\textsuperscript{*}, Stina-Mina Ehn Börjesson\textsuperscript{a,c}, Karin Höijer\textsuperscript{a,c}, Viktoria Olsson\textsuperscript{a,c}, Elisabet Rothenberg\textsuperscript{b,c}, Karin Wendin\textsuperscript{a,c,}\textsuperscript{d}

\textsuperscript{a} Dept. of Food and Meal Science, Faculty of Natural Science, Kristianstad University, Elmetorpsvägen 15, SE-291 88, Kristianstad, Sweden
\textsuperscript{b} Dept. of Nursing and Integrated Health Sciences, Faculty of Health Science, Kristianstad University, Elmetorpsvägen 15, SE-291 88, Kristianstad, Sweden
\textsuperscript{c} The Research Group Meal – Food and Meals in Everyday Life, Kristianstad University, Sweden
\textsuperscript{d} Dept. of Food Science, University of Copenhagen, Rolighedsvej 26, DK-1958, Fredriksberg, Denmark

\textbf{ARTICLE INFO}

Keywords:
Circular
Gastronomy
Sustainability
Food
Compound concept

\textbf{ABSTRACT}

Environmental, as well as economic and social/cultural aspects of sustainability, are important when striving for sustainable production and consumption of food and meals. However, a terminology including specific concepts within the combined area of food, meals and sustainability is lacking. In order to investigate how food, meals and sustainability can be conceptualized together, the aim of this paper is to explore the compound concept of circular gastronomy to discover how it can be understood and applied, and its potential opportunities and challenges. A further aim is to provide a definition of circular gastronomy. The data collection was conducted in two phases of an explorative sequential mixed-method study comprising qualitative focus groups followed by a web-based survey. The results revealed the complexity in the compound concept of circular gastronomy, both in what might be included and in how it could be understood and applied. Circular gastronomy was considered to be useful, interesting and trendy; however, understanding circularity and gastronomy as a compound concept was also found to be challenging. As a result of the study, and previous understandings of circular and gastronomy, a definition of circular gastronomy is provided. Developing the understanding of circular gastronomy is an attempt to contribute to the conceptual development of the combined area of food, meals and sustainability.

1. Introduction

Food production and consumption is currently responsible for about 25–30% of total greenhouse gas emissions (GHGE). In Agenda 2030 and the Sustainable Development Goals (SDGs), environmental, economic and social/cultural aspects of sustainability are emphasized as being important when striving for the sustainable production and consumption of food and meals (United Nations, 2015). However, a terminology with specific concepts within the combined area of food, meals and sustainability is lacking. When talking about sustainable development, the terms \textit{circular} and \textit{cycles} are often used, stating the importance of the principles of recycling and repair instead of the linear thinking of making, using and disposing. The concept of \textit{circular economy} gained interest in the 1970s as a result of ambitions to achieve sustainable development (see, for example Lieder and Rashid 2016). It has its background in the concept of \textit{industrial ecology}, which focuses on \textit{circular systems} where waste should be limited and then used in the production of new products, thus reducing the need for new resources (Stahel, 2016). However, the relationship between the concepts of circular economy and sustainability has been questioned (Geissdoerfer et al., 2017). In the study by Geissdoerfer et al. (2017), arguments were raised concerning whether circular economy should be understood more narrowly than sustainability, but also that, when talking about circular economy, there might be a risk of excluding other dimensions of sustainability, for example the social dimension (ibid.). However, others argue for all dimensions of sustainability being present in the understanding of circular economy, although highlight the risk of the concept being treated mainly as a practical, loosely defined concept rather than a concept based in science (Korhonen et al., 2018).

In recent decades the term \textit{circular} has also been adopted in relation to other areas, such as design and clothing, with the creation of new concepts such as \textit{circular design} (Desing et al., 2021) and \textit{circular fashion} (Vehmas et al., 2018). In accordance with the environmental impact of food production and consumption, food has been acknowledged to play...
an important role in implementing the principles of a circular economy, and it is therefore an interesting field to test new approaches and understandings of a circular thinking defined as “the circular economy of food” (Fassio and Tecco, 2019).

Another concept related to food and meals is gastronomy. This concept has its roots in French cooking. In the 19th Century, Brillat-Savarin highlighted the multidimensional approach to food, stating that gastronomy was “the reasoned comprehension of everything connected with the nourishment of man” (Brillat-Savarin, 1970, p. 52). Later descriptions have also highlighted this interdisciplinary approach to food (Santich, 2007). By including the how, what and why of eating and drinking, gastronomy encapsulates the entire spectrum from the human and social sciences to the natural sciences (Santich, 2007). Jönsson and Tellström further described gastronomy as the acts of eating and drinking combined with, and understood by, its social and cultural context, thus embracing how food is cooked, prepared and presented (Richards, 2002) and further emphasizing the experience of the entire meal. This has also been reflected in the following definition “Food and meal designs with high knowledge content in order to stimulate pleasure in the meal consumer” (Jönsson and Tellström, 2009). However, even though the concept has a long history, arguments have described its lack of maturity on a more conceptual level (Rojas-Rivas et al., 2020).

Development and definitions of concepts are necessary for our observations, understanding and experience of a phenomenon. The term concept has been defined as a navigation instrument that reflects society but also helps shape and reshape our understanding of it (Kurunmäki and Marjanen, 2018). It is a mental construction and a cognitive symbol that aims to organize our thinking and understanding of various phenomena, as well as create meaning within the scientific field (Podsakoff et al., 2016). Importantly, concepts are not static; instead they mirror what matters at a certain time and place. This also implies that already established concepts need to be redefined over time, and previous concepts compound in new ways to help us understand a changing society and our perception of it.

In this paper, to investigate how food, meals and sustainability can be conceptualized together, we explore the compound concept of circular gastronomy in order to discover how it can be understood and applied, and its potential opportunities and challenges. Such a compound concept might be of value for scholarly research and literature in the field, as well as for stakeholders within different fields, such as government, industry and public meals, for the improvement of policymaking and practice. The aim of this study is, therefore, to explore circular gastronomy as a new compound concept and to provide a definition.

2. Material and methods

Data exploring the compound concept of circular gastronomy was collected in two phases of an explorative sequential mixed-method study (Creswell, 2014), where qualitative focus groups were followed by a web-based survey. Following this methodological approach, the initial phase was a qualitative exploration, and the second phase a quantitative investigation and thereafter an integration of the results was conducted. The aim of the focus groups was to provide an initial understanding of the concept in order to develop ideas as to how it could be applied. These ideas were then further investigated in the survey.

In phase 1, three focus groups were conducted with professionals working with food and meals in the private and public food sectors and within higher education in Sweden. Interviewing experts and gaining expert understanding of a certain field is considered to be a well-known qualitative approach (Göringer, 2021). Purposeful sampling was employed, and the participants were recruited based on their expertise, professional knowledge and experience within the field of food and meals, and for their ability providing valuable insights in relation to this compound concept. They were contacted in person and asked if they were interested in participating in the study. In total, eight persons (six women and two men) participated in the three focus groups using the digital communication tool Zoom. One of the authors acted as moderator for the focus groups, which lasted approximately 45 min. Discussions were conducted in Swedish, and quotes used in the results section have been translated into English for this paper. The questions discussed in the focus groups dealt with:

- circular gastronomy as a compound concept - associations and thoughts
- how circular and gastronomy as separate concepts were understood
- challenges, opportunities and possible applications and contexts for the compound concept

In phase 2, based on the results of the focus groups, a survey was developed by the researchers where the questions as well as the fixed answer options provided were solely based on the discussions taking place in the focus groups. The survey was distributed through purposive sampling to university students studying their final year of a Bachelor or Master program related to food, meals, eating and/or nutrition in Sweden. In total about 600 students were exposed to the questionnaire that was posted via the students’ digital program platforms at the universities. The questionnaire was created in EyeQuestion (Logi8, The Netherlands) and included both open-ended questions and questions with fixed answer options which dealt with what associations the respondents made with, and their perceptions of, circular gastronomy (see Table 1). A pilot version was conducted with five respondents before the actual study.

2.1. Data analysis

The focus groups were analysed using a thematic analytical approach (Braun and Clarke, 2006) where the video-recorded material was transcribed verbatim and then coded and analysed thematically, focusing on the main aim of the study. The analysis resulted in the following themes: “Associating with a novel concept”, “Combining (in)compatible concepts”, “Alternative concepts? ‘Sustainability’ in relation to ‘circular’” and “Arenas for circular gastronomy – applications and implications”.

Quantitative data from the survey was analysed by calculating frequencies, mean values and standard deviations. Continuous data were further subjected to Student’s t-test. Frequency data were subjected to Cochran’s q-test (IBM SPSS version 27). Differences were considered as significant when p < 0.05.

2.2. Ethical considerations

The study has been conducted according to the ethical guidelines from the Swedish Research Council and in accordance with the Helsinki Declaration of Ethical Principles.

Participation in the study was voluntary. The professionals were contacted in person regarding interest in participating in a focus group. They were informed about the overall aim of the study and that they did not have to prepare anything in advance. The participants also gave signed informed consent before the focus group took place. The survey was anonymous, and the answers could not be traced back to an individual participant. The answers and transcripts will only be used in the present study. We assess that there are no specific risks associated with participation in the study, neither in the focus groups nor in the survey.

3. Results

The results from the focus groups are presented first (phase 1), summarizing how circular gastronomy as a novel and compound concept was understood and defined, but also the challenges, opportunities and applications of the concept that were identified. Quotes from the focus groups are used to illustrate the themes identified in the analysis, defined as FG 1–3. The results from the survey (phase 2) are
3.1. Phase 1 – the focus groups

3.1.1. Associating with a novel concept

The participants in the focus groups were initially asked to describe, without any guidance, what they associated the compound concept of circular gastronomy with, in order to gain some idea of how it was perceived and understood. Circular gastronomy was mainly associated with aspects related to circles in nature, locally produced food, reducing food waste, and resource efficiency. Ideas of circularity often dealt with something that included a whole process from seed to a finished product or service.

3.1.2. Combining (in)compatible concepts

Combining the concepts of ‘circularity’ and ‘gastronomy’ into one compound concept implies challenges as well as possibilities. The need for a proper definition was raised several times in the focus groups, but also a positive feeling that the concept, if properly defined, could represent an entity.

“(…) that you take something from the earth and then use it and give it back to the earth again (…) that everything goes in circles, that you harvest and then eat and then you get waste and reuse it. But we still have a long way to go there (FG1).

“Circularity, then you think that it is something that should be reused, that it will be used again, that is my thought (…)” (FG3)

“(…) that you re-create food from food that would otherwise be wasted. So that everything that is produced will be used again to the greatest extent” (FG3).

However, when trying to understand “circular” in relation to circular gastronomy, one focus group participant imagined that it could also be related to something religious, being interpreted in more philosophical terms:

“When I’m thinking about circular, I think of some kind of … something religious, I see in front of me such religious thoughts when things follow a circle (…) that it is on a more philosophical level … (FG3)

Although not elaborated in the focus groups, the cultural aspects of gastronomy and its relation to sustainability and circularity were touched upon:

“You discussed before about the cultural aspects of gastronomy … for me this is key, if you think about integration and all that. Food is clearly a fantastic icebreaker and that is …, that leads to sustainable development if you can build bridges and meet across food cultural borders. That has probably not that much to do with circularity, but a sustainable development where gastronomy could be a part” (FG3)

Table 1

<table>
<thead>
<tr>
<th>Question number</th>
<th>Question</th>
<th>Response options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background 1</td>
<td>What is your gender?</td>
<td>One choice&lt;br&gt;• Woman&lt;br&gt;• Man&lt;br&gt;• Neutral&lt;br&gt;Give year&lt;br&gt;One choice&lt;br&gt;• Food&lt;br&gt;• Technology&lt;br&gt;• Gastronomy/Hospitality&lt;br&gt;• Teacher</td>
</tr>
<tr>
<td>Background 2</td>
<td>Year of birth</td>
<td>Give year&lt;br&gt;One choice&lt;br&gt;• Female&lt;br&gt;• Male&lt;br&gt;• Other&lt;br&gt;Give year&lt;br&gt;One choice&lt;br&gt;• Female&lt;br&gt;• Male&lt;br&gt;• Other</td>
</tr>
<tr>
<td>Background 3</td>
<td>In which subject area are you studying?</td>
<td>Give year&lt;br&gt;One choice&lt;br&gt;• Food&lt;br&gt;• Technology&lt;br&gt;• Gastronomy/Hospitality&lt;br&gt;• Teacher</td>
</tr>
<tr>
<td>Background 4</td>
<td>Do you have professional experience within the food sector?</td>
<td>One choice&lt;br&gt;• Yes&lt;br&gt;• No&lt;br&gt;One choice&lt;br&gt;• Yes&lt;br&gt;• No</td>
</tr>
<tr>
<td>Survey 1</td>
<td>Consider the term circular gastronomy and describe what you associate this with</td>
<td>Free text&lt;br&gt;Free text&lt;br&gt;Free text&lt;br&gt;Free text</td>
</tr>
<tr>
<td>Survey 2</td>
<td>Which of the following alternatives best describes the concept of circular gastronomy?</td>
<td>One choice&lt;br&gt;• Locally produced&lt;br&gt;• Re-use&lt;br&gt;• Re-create&lt;br&gt;• Resource efficiency&lt;br&gt;• Circularity&lt;br&gt;• None of the given alternatives</td>
</tr>
<tr>
<td>Survey 3</td>
<td>Which of the given aspects may be connected to the term of circular gastronomy?</td>
<td>Multiple choice&lt;br&gt;• Social sustainability&lt;br&gt;• Economic sustainability&lt;br&gt;• Ecological Sustainability&lt;br&gt;• None of the sustainability goals</td>
</tr>
<tr>
<td>Survey 4</td>
<td>Are the terms circular and sustainable equivalent?</td>
<td>Scale 0–100, where 0 = disagree fully 100 = agree fully&lt;br&gt;Scale 0–100, where 0 = disagree fully 100 = agree fully</td>
</tr>
<tr>
<td>Survey 5</td>
<td>How much do you agree with the following statements: Circular gastronomy is …</td>
<td>Scale 0–100, where 0 = disagree fully 100 = agree fully&lt;br&gt;Scale 0–100, where 0 = disagree fully 100 = agree fully</td>
</tr>
<tr>
<td>Survey 6</td>
<td>Within which areas might the term circular gastronomy be used?</td>
<td>Multiple choice&lt;br&gt;• Not useful anywhere&lt;br&gt;• Politics&lt;br&gt;• Public meals&lt;br&gt;• Academy, research and innovation&lt;br&gt;• Hospital and health care&lt;br&gt;• Food industry&lt;br&gt;• Meals within elderly care&lt;br&gt;• School meals&lt;br&gt;• Restaurants/Hospitality</td>
</tr>
</tbody>
</table>
“(...) in some way I think it is an awkward combination, circular gastronomy, because I have problems with gastronomy, it [Gastronomy] is so connected with eating and the food itself, and for me it doesn’t have much to do with biogas production, the things that are left after we have eaten. Gastronomy is such a ... it is so connected to food and meals that it limits how big the circle should or could be ... I have difficulty thinking about circular gastronomy” (FG1)

This also relates to the discussions about how circular and gastronomy might be on different system levels, making them difficult to combine:

“(...I’m thinking gastronomy, what is the system perspective for that? Where does it start and end? And is it then possible to put something that is circular around it? Economy is wide, but it is easier to associate with an economy being circular or an ecosystem, but how does gastronomy become circular when it is part of a bigger system? And what happens when you connect these two concepts?” (FG2)

This generated discussions about what would happen if we instead talked about gastronomy as part of a circular economy:

“Gastronomy is supposed to work in the circular economy, that is if society works on different fronts to reach a circular economy, because in that [the circular economy] it is about how we take resources from nature and how we refine and design them and give back to nature again, and then, what we are doing within gastronomy should be part of this” (FG2)

3.1.3. Alternative concepts? ‘Sustainability’ in relation to ‘circular’

During the focus groups various alternative concepts and combinations of concepts were mentioned as part of a creative discussion about providing meaning and understanding to circular gastronomy. The relationship between ‘circular’ and ‘sustainable’, and how this could be understood in relation to gastronomy, was pointed out in all groups. What was the actual difference between circular and sustainable, or could these terms be interchangeable?

“(...) for me, circular is when a material is moving around, and then we have another concept which is sustainable (...) if you say ‘sustainable gastronomy’, what are the associations there then? Then maybe this is a wider concept? Circular gastronomy, yes, we move things and it is part of a ‘natural cycle’, but it might also mean that we transport a lot of material long distances and maybe that is not so sustainable, but it is circular because we transport the waste back to the farmer, or whatever it is. But circular, if it should be a good thing in these days and in the future, then it can’t be the opposite of sustainable. Because sustainable, to me, is an overarching concept (...) Circular is ... for me a rather specific concept, and that is that you use the material in a system, but it doesn’t have to be sustainable” (FG2)

There were also some critics of the use of circular in itself and ideas were put forward about just talking about sustainability instead. This would imply the use of sustainable gastronomy as well as sustainable food and meals instead of circular gastronomy:

“I would like to have ‘sustainable gastronomy’ representing the bigger overarching concept, and then to fill that with the other concepts [e.g. circular gastronomy]. Then you turn it upside down (…) then circularity becomes part of sustainable gastronomy, if you want to point out the idea of being circular (reusing)” (FG3)

However, there were also ideas about circularity being wider and more inclusive than sustainability:

“(...) working closer with the local producer and how you take care of the food waste and so on” (FG 2)

“(...) gastronomy is kind of a fine word (...) gastronomy is probably not the word that you use in elderly care” (FG1)

However, there were also ideas about how circular gastronomy could be something to work towards, and that it could imply:

“(...) working closer with the local producer and how you take care of the food waste and so on” (FG 2)

“(...) working closer with the local producer and how you take care of the food waste and so on” (FG 2)

Table 2

<table>
<thead>
<tr>
<th>Background variables of respondents of the survey.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Neutral/No information</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>21–30</td>
</tr>
<tr>
<td>31–40</td>
</tr>
<tr>
<td>41–50</td>
</tr>
<tr>
<td>&gt;51</td>
</tr>
<tr>
<td>Training</td>
</tr>
<tr>
<td>Hospitality/Gastronomy</td>
</tr>
<tr>
<td>Food technology/science</td>
</tr>
<tr>
<td>Teacher training Home Economics</td>
</tr>
<tr>
<td>Food and nutrition</td>
</tr>
<tr>
<td>Professional experience</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
</tr>
</tbody>
</table>
Home and Consumer Studies, from studies within hospitality/restaurant and gastronomy, as well as food science and technology. The remainder were students within the field of food and nutrition, including dietitians. The majority of the respondents had previous working experience, primarily within restaurants but also within retail, as product developers within the food industry and as teachers in Home and Consumer Studies.

3.2.2. Associations made with circular gastronomy

The first question in the survey asked respondents to write down three words that represented their initial thoughts about the compound concept of circular gastronomy. The results are shown in a word cloud below (Fig. 1). Circular gastronomy was mostly related to some aspect of sustainability, circularity and food. As can be seen in the figure, many different words were associated with the concept.

In the next survey question the respondents were asked to consider which alternative they thought best described the concept of circular gastronomy; the alternatives were derived from the results of the focus groups. As shown in Table 3, the concept ‘circularity’ was significantly the most common choice followed by ‘resource efficient’.

3.2.3. Circular gastronomy and dimensions of sustainability

When connecting different aspects of sustainability to circular gastronomy, a significant majority chose ‘ecological sustainability’ and ‘economic sustainability’ (Table 4). There were also respondents who considered ‘social sustainability’ to be connected with circular gastronomy.

In total, 42 respondents wrote written comments to the question regarding aspects of sustainability that could be connected to circular gastronomy. Of these, 17 noted how all aspects of sustainability could be connected/related to circular gastronomy, that they “go hand in hand”, everything is connected and, as one respondent expressed it, “in circular gastronomy I think you gain advantages within ecological, economic and social sustainability”. Seven of the respondents stated that the concept was more related to the environmental aspect of sustainability, and some highlighted both the ecological and economic aspects as central to understanding the concept, in terms of earning money and the reuse of resources. The social/cultural aspect of sustainability as a separate dimension was mentioned by a few respondents, but also noted in terms of “gastronomy has to do with food culture” and “Think that maybe it should be used more in relation to the social aspects, since the economic and ecological aspects can be too close to sustainable gastronomy as a concept”.

Finally, in this section of the survey, the respondents were asked to give an opinion regarding the statement about whether circularity and sustainability could be understood and used equivalently. The respondents agreed to a level of 56 ± 26 (m ± std) on a scale ranging from 0 to 100 (where 0 = totally disagree and 100 = totally agree).

Respondents were also asked to consider if circular gastronomy and sustainable gastronomy could be used interchangeably. The respondents agreed to a level of 59 ± 27 (m ± std) on a Likert scale ranging from 0 to 100 (where 0 = totally disagree and 100 = totally agree).

3.2.4. Circular gastronomy – perceptions, usefulness and applications

To increase the understanding of how the compound concept of circular gastronomy was perceived, the respondents were asked to consider and evaluate statements on a scale ranging from 0 to 100 (where 0 = totally disagree and 100 = totally agree). This resulted in an indication of how the respondents valued circular gastronomy in relation to statements such as ‘Hard to define’. The results are given in Table 5, where a significant majority found circular gastronomy to be necessary and useful. There was, however, a minor proportion of the respondents who found the compound concept of circular gastronomy to be too close to sustainable gastronomy as a concept.

Table 3
Alternatives respondents chose to describe circular gastronomy.

| Alternatives                           | N
|---------------------------------------|---|
| None of the given alternatives        | 1\c
| Locally grown                         | 2\b
| Re-use                                | 4\a
| Re-create                             | 7\b
| Resource efficient                    | 30\b
| Circularity                           | 41\c

Significant (p < 0.05) differences calculated by Cochran’s Q-test. Different letters indicate significant difference.

Table 4
Aspects connected with circular gastronomy.

| Aspects                      | N
|------------------------------|---|
| None of the given aspects    | 6\a
| Economic sustainability      | 43\b
| Ecological sustainability    | 57\c

Significant (p < 0.05) differences calculated by Cochran’s Q-test. Different letters indicate significant differences.

Table 5
Perception of circular gastronomy.

| What is circular gastronomy? | m ± std
|-------------------------------|------|
| Hard to define                | 58 ± 27\b
| Problematic                   | 38 ± 27\b
| Needed                        | 72 ± 29\a
| Unnecessary                   | 25 ± 29\a
| Trendy                        | 67 ± 28\a
| Useful                        | 71 ± 29\a

Significant (p < 0.05) differences calculated by Student’s t-test. Different letters indicate significant difference.
be problematic.

In the question concerning the contexts in which the concept of circular gastronomy could be useful and applicable, the respondents could choose from a number of meal contexts, Table 6. It was considered that circular gastronomy could be used in all of the stated food contexts. Very few respondents considered that the concept of circular gastronomy was not useful.

In the written comments provided in relation to this question (7 comments in total), one respondent wrote “In all contexts where food is prepared/produced or served” and another wrote “In all ‘professional’ contexts where food is handled”.

4. Discussion

The aim of this study was to explore circular gastronomy as a new compound concept, how it could be understood and applied, the opportunities and challenges of this concept, and also to provide a definition of circular gastronomy.

This section is structured according to the combination of converging results from the qualitative and quantitative parts of the study. Interpretations of results are then discussed in relation to the literature. Methodological strengths and limitations and their impact on the results are also discussed.

4.1. Circular gastronomy - understandings and applications

The interpretation of the results from this explorative study revealed the complexity of the compound concept of circular gastronomy, both in what might be included and how it could be understood and applied. The compound concept was considered by the participants in both parts of the study to be useful, interesting and trendy. However, the understanding of circularity and gastronomy in a compound concept and how the concept could be defined were also found to be challenging. In both the focus groups and the survey, the participants primarily associated circular gastronomy with some aspects of sustainability related to food, to closed loops and circles in nature, as well as to the reuse of resources, resource efficiency and recycling of food that would otherwise be wasted. These aspects are also recurrent in descriptions of circular economy (Stahel, 2016) as well as in more recent concepts where circular has been included, such as circular design (Desing et al., 2021) and circular fashion (Vehmas et al., 2018), where reuse and recycling are the essential elements. In both parts of the study, the focus groups were perceived to be applicable in different areas, such as restaurant settings and public meals, but also relevant for food companies and within education.

Exploring the concept of circular gastronomy in the study gave new opportunities for how aspects of food, meals and sustainability can be understood and applied. Critique of the concept circular economy has in part dealt with its ambiguous relationship to sustainability, specifically the focus primarily on the ecological and economical aspects of sustainability (see e.g. Geisdoerfer et al., 2017). In our initial thinking about circular gastronomy, one of our ambitions was to investigate if this compound concept could embrace a broader understanding and applicability of the social aspects of sustainability in relation to food and meals. Even though in this study circular gastronomy was perceived to be related to both the ecological, economic, and social aspects of sustainability, the concept was stated by the participants to be primarily related to ecological sustainability. However, interesting thoughts were expressed in the focus groups and in the open-ended questions in the survey regarding how circular gastronomy could include and benefit from several of the UN 17 global sustainability goals in relation to food and meals (United Nations, 2015). We foresee that an applied compound concept of circular gastronomy could be useful in the food arenas mentioned to maintain sustainable diets in accordance with the EAT Lancet report (Willett et al., 2019).

4.2. Circular gastronomy – challenges and opportunities

The focus groups further pointed out several challenges that could be identified in relation to circular gastronomy and when the two concepts ‘circular’ and ‘gastronomy’ are combined. Concerns regarding the limits of circularity, as well as how gastronomy should be defined, emphasize central aspects in our ability to use, apply but also define the concept. This means that, in trying to provide a definition of this compound concept, we need to revise and adapt our understanding of the separate concepts to build an understanding of circular gastronomy. In the core of gastronomy lies the entirety of a meal, the art of food and eating as well as its physiological processes, implying that it embraces both a social science and a natural science understanding of food and meals (see e.g. Richards, 2002; Santich, 2007). It was noteworthy how, when discussing ‘gastronomy’, the participants questioned the inclusiveness of the concept in various ways, both in relation to only a small part of the food system being captured in the definition of gastronomy, but also in relation to the type of meals that apply. Circularity has been filled with ideas about closed loops, reducing waste and recycling. One of the challenges, therefore, is to understand gastronomy as part of a circular system.

Concept development and analysing a concept may have different purposes. This can be relevant when there is uncertainty or disagreement regarding the actual meaning of a concept, which could be both in relation to well-known concepts and novel concepts. However, it could also be of relevance when concepts that were previously defined separately are put together as compound concepts or when concepts are transferred from one area or field to another with the aim of gaining new insights and understandings. The latter is sometimes called concept derivation (Lillekroken, 2014; Walker and Avant, 2011), meaning that the concept is transferred from one field or domain to another where it has previously not been used. This is also what happens when we place the concept of circularity together with the concept of gastronomy, creating a new, compound concept, and by doing so, creating new meanings of these concepts.

As previously stated, a terminology with specific concepts within the combined area of food, meals and sustainability is lacking. We believe the development of such a ‘language’ might be of value for scholarly research and literature progression in the field, as well as for the improvement of policy making and practice within different arenas connected to food and sustainability. In accordance with Agenda 2030 (United Nations, 2015) and the sustainable development goals, sustainability is a broad concept focusing on reaching desirable conditions in a number of different areas, whereas circular indicates a process taking place in closed loop systems. In this context, the sustainable development goals should be interpreted in terms of all resources being used as efficiently as possible and waste being limited. In this sense, circular processes become tools in an effort to achieve several of the sustainable development goals.

The United Nations (UN) has defined ‘sustainable gastronomy’ as a

<table>
<thead>
<tr>
<th>Suitable areas</th>
<th></th>
</tr>
</thead>
</table>
| The statement is not useful                         | 6*a  
| Politics                                            | 45*b  
| Meal supplier within public sector                  | 54*c  
| Academia, education, research, collaboration, innovation | 56*c  
| Meals in health care and hospitals                  | 57*d  
| Food companies                                      | 61*e  
| Meals within elderly care                           | 62*e  
| Meals in public schools                             | 64*e  
| Restaurants/Hospitality                              | 66*e  

Significant (p < 0.05) differences calculated by Cochran’s Q-test. Different letters indicate significant difference.
“cuisine that takes into account where the ingredients are from, how the food is grown and how it gets to our markets and eventually to our plates” (United Nations, n.d.) Instead of ‘sustainable gastronomy’, using the term circular in combination with gastronomy emphasizes the reuse and recycling of resources as well as the tastes and experiences of food and eating, knowledge, traditions and rituals. In accordance with what is stated above regarding the relationship between sustainability and circularity, and considering the UN definition of sustainable gastronomy, we suggest the following definition of circular gastronomy:

“The knowledge and skills of food and meal designs, focusing on re-creation and re-design, in order to stimulate gastronomic development for a sustainable future”.

This definition is based on previous understandings of circular and gastronomy, combined with insights from the survey and focus groups, and should be considered to be a first step towards an exploration of this compound concept. The definition includes the food itself, as well as the meal, in circular thinking, taking ecological, economic, and social/cultural aspects into account.

4.3. Strengths and limitations

This study was conducted as a mixed-methods study with qualitative focus groups (phase 1) followed by a web-based survey (phase 2). Focus groups was perceived as a relevant method in our attempt to discuss and elaborate on the compound concept of circular gastronomy, as well as its usefulness and applicability. The composition of the focus groups, however, consisting of professionals recruited for their specific knowledge within the field of food and sustainability, might have impacted the results in terms of how the concept was understood. Moreover, the numbers of focus groups and participants were limited. There were three participants in two of the focus groups, but only two in one focus group, due to a late cancellation. Nevertheless, since the ambition was to explore a new concept, there were advantages in having focus groups with fewer participants while at the same time recruiting participants with experience and pre-understanding of the study area.

The findings from the focus groups formed the basis for the survey and were then used to increase our knowledge of how the concept could be understood among a larger population. The survey was distributed to students at different university programs within the field of food and nutrition in Sweden. This choice was conscious since we were interested in the view of students with insight and interest in food and nutrition, meaning that purposeful sampling was conducted. However, it could also be regarded as a limitation since these students have a pre-understanding within the field of food and nutrition. Moreover, the response rate was 14%, which is very low. The selection of students in combination with low response rate limits the generalizability of the results. Nevertheless, it could also have been of interest to include students from other educational programs, as well as to include other populations, to gain a broader spectrum of views. An overwhelming majority of respondents in the survey were women, which reflects the gender distribution in these educational programs in Sweden. Students studying home economics and food and nutrition were in the majority, which also reflects the number of students in these education areas. A further limitation might be that we have not conducted a systematic search when reviewing the literature in the area of food and sustainability; however, the study takes its point of departure in the research field of sustainability in relation to food and gastronomy.

5. Conclusion

The exploration of the compound concept of circular gastronomy showed that it was perceived as an interesting and useful concept that could be applied in various contexts related to food and meals. However, there were also concerns about the need for a clear definition and about how the concepts circular and gastronomy relate to each other. Based on the study results and prior understandings about the concepts ‘circular’ and ‘gastronomy’ the following definition of circular gastronomy was suggested: “The knowledge and skills of food and meal designs, focusing on re-creation and re-design, in order to stimulate gastronomic development for a sustainable future”. Developing an understanding of circular gastronomy is an attempt to contribute to the conceptual development of food, meals and sustainability in food-related concepts. Future studies will be needed to further explore this compound concept as well as its applicability and usefulness in different areas and sectors.

6. Implications for gastronomy

Our ambition has been to contribute to the development of the language within the field of food and sustainability by creating and exploring the new concept circular gastronomy. Language, as well as specific concepts, affect our perception of existence and thereby actions and activities. Thus, the compound concept of circular gastronomy has the potential to fill a gap, which may enable progress within scholarly research, policy making, and practice within the field. Furthermore, circular gastronomy has the potential to impact gastronomy by bringing meal experiences, health benefits and environmental aspects together across the entire value chain, from farmers to consumers. By focusing on re-creation and re-design the concept could serve as the missing link that brings together and closes this chain, making it circular rather than linear.

Statement for conflict of interest

The authors of the research paper titled “Circular gastronomy – exploring a new compound concept at the interface between food, meals and sustainability” declare no conflicts of interest.

Author statements

The entire study has been a collective process of all participating authors, and a part of a collaborative work within the research group Meal – Food and meals in everyday life at Kristianstad University, Sweden. This means that conceptualisation, data curation and formal analysis, as well as investigation, methodology and validation were conducted as part of a joint process. MN had the main responsibility for the original draft preparation, however, all authors participated in the reviewing, editing and the visualisation of the manuscript.

Declaration of interest

The authors have no conflicts of interest to disclose.

Data availability

Data will be made available on request.

Acknowledgements

The authors would like to thank the participants in the focus groups as well as the respondents that took the time to fill out the survey. The research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References


