

# Date labels 2021 Consumer practice, perceived risk and self-efficacy

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Advisory report from DCA - Danish Centre for Food and Agriculture

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## Data sheet

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# Summary

## Background and aim

Date labels are meant to guide the consumers decisions on the edibility of a product that has passed its expiry date. The labels 'best before' and 'use by' convey two different messages. A product carrying a 'use by' label should be thrown out once the date has expired for safety reasons. A product carrying a 'best before' label assures consumers that the quality of the product is in order until the given date, and they should check the edibility after the date has expired before they decide whether to discard the product or not. Studies show, that consumers do not necessarily differentiate between these two types of labels when they decide whether to throw a product out or not. On one hand, this may cause consumers to either waste food unnecessarily, because they throw products labelled 'best before' out, or put them at risk for contracting foodborne illnesses, because they use products labelled 'use by' after the date on the product has expired.

A survey study among 3.114 Danish consumers revealed that more than half check the edibility of a product, prior to throwing it out, irrespective of the type of date label (Hansen & Lättheenmäki, 2021). The decision to throw out a product depended more on the respondents' attitude toward using products beyond their expiry date. Respondents who perceived a greater risk associated with eating expired products, were more likely to throw a product out. Furthermore, respondents' confidence in their ability to judge the edibility of expired products using their senses.

Yet, relatively little is known about, how date labels contribute to consumers' risk perception and assessment, nor do we fully understand what role different types of products and time beyond the expiry date plays in risk perception. The aim of this report is to explore, how consumer perceptions of the risks associated with expired date labels food depend and change with time in selected product categories.

## Method

We are mainly interested in practices related to this risk perception and therefore take qualitative approach allowing consumers to decide on what they would do in certain situations and give the reasoning in their own words.

The report consists of two studies. The first study is based on 15 online interviews with consumers. Interviewees were given different scenarios regarding, how they would handle foods with expired or expiring date labels, if they came across them in their home. Specifically, they were asked to identify risks associated with consuming the product, how they would mitigate this risk, and their ability to judge the edibility of chosen products. Finally, they were asked about their beliefs regarding the date labels.

The second study is based on three focus groups with 15 consumers in total. Participants in the focus groups were asked to discuss the merits of various quotes from the interviews. These covered themes such as risk, handling, time distance to expiry date, and feelings of disgust. Further, they were asked to deliberate on, why the date labels are set as they are, who benefits from their existence, and if they trust the information carried in them.

### Results and conclusions

During the interviews, themes that emerged were risk of illness, product category specific risks, and risks related to open versus sealed products. When it came to handling, participants emphasised kitchen hygiene and appropriately storing food products, as well as ensuring that products with expired dates are heated up before consumption. However, most participants agreed that the risks associated with eating expired date foods were minimal, so long as one used one's common sense when checking the edibility of products. A few participants discussed feelings of disgust when it came to eating expired foods, and preferred disposing of food past its date. Finally, interviewees discussed various common-sense beliefs about the date label. Most prominently the belief that there is a margin of error on both sides of the date given, which allows them to safely consume foods past their *'use by'* date.

The aim of the focus groups was to further explore the themes that emerged through the interviews. Similar to the interviews, focus group participants agreed that risks associated with eating foods with expired date labels depended on the type of product, with fresh meats being seen as most risky. Further, they emphasised the need for kitchen hygiene, as well as hygienic practices in storing the products to minimise risks of foodborne illnesses. Focus group participants also put great emphasis on consumers using common sense and checking the edibility of products, rather than relying exclusively on date labels. Throwing food out on principle, once it passed its date, was seen as wasteful by the focus groups, and they tended to be very concerned with food waste and the environment in general. When talking about their beliefs regarding the date labels, most focus group participants believed that date labels were conservatively set, meaning food could be safely consumed past the expiration date. However, despite this, participants did express that they trusted the date labels, but that they preferred to check edibility themselves.

# Resumé

## Baggrund og formål

Datomærker er med til at guide forbrugerne, når de skal beslutte om en fødevarer kan spises efter udløbsdatoen. Mærkerne '*bedst før*' og '*sidste anvendelsesdato*' formidler to forskellige budskaber. Et produkt mærket med '*sidste anvendelsesdato*' bør smides ud, når datoen er overskredet, da produktet udgør en sundhedsrisiko. Et produkt mærket med '*bedst før*' forsikrer forbrugeren om at kvaliteten er i orden frem til datoen, og at produktet kan spises efter, såfremt produktet lugter, smager og ser fint ud. Studier viser dog at forbrugere ikke nødvendigvis forstår forskellen mellem datomærkerne, når de skal beslutte om de skal smide et produkt ud. På den ene side kan dette føre til madspild, hvis forbrugere smider fødevarer mærket '*bedst før*' ud så snart datoen er overskredet, på den anden side risikerer forbrugere at få fødevarerborne sygdomme (eks. Salmonella), hvis de bruger produkter mærket med '*sidste anvendelsesdato*' efter de har overskredet deres dato.

En spørgeskemaundersøgelse blandt 3.114 danske forbrugere afslørede at mere end halvdelen tjekker spiseligheden af et produkt, før de vælger om de skal smide det ud, ligegyldigt hvilket mærke produktet bærer (Hansen & Lättheenmäki, 2021). Beslutningen om at smide et produkt ud, beroede på deltagernes generelle holdning til at spise produkter, der er gået over dato. Respondenter, som oplevede at der var en større risiko forbundet med at spise produkter som var gået over dato, havde større tendens til at smide produkter ud. Derimod, var respondenter, der havde stor tiltro til deres egen evne til at bedømme spiseligheden af et produkt, mindre tilbøjelige til at smide produkter over dato ud.

Dog har vi ikke den store viden om, hvordan datomærkerne bidrager til forbrugernes opfattelser og vurderinger af risiko. Vi ved heller ikke, hvordan produkttype og hvor lang tid et produkt er gået over dato medierer forbrugernes opfattelse af risiko. Formålet med denne rapport, er at udforske, hvordan forbrugernes opfattelser af risikoen forbundet med udløbsdatoer beror på og ændres over tid og med forskellige produkttyper.

## Metode

Eftersom vi er interesseret i den praksis der relaterer sig til forbrugernes opfattelse af risiko, har vi valgt at tage en kvalitativ tilgang til problemstillingen, da denne giver forbrugeren mulighed for at beslutte, hvad de vil gøre i bestemte situationer, samt give deres begrundelse for disse beslutninger med deres egne ord.

Rapporten består af to undersøgelser. Den første undersøgelse beror på 15 online interviews med forbrugere. Deltagerne blev bedt om at tage stilling forskellige scenarier omkring, hvordan de ville håndtere fødevarer tæt på eller over dato i deres hjem. Specifikt blev de bedt om at identificere risici forbundet med at bruge produktet, hvordan de ville mindske denne risiko, og deres evne til at

bedømme spiseligheden af de valgte produkter. Ydermere, blev de spurt om deres opfattelser om datomærkerne.

Den anden undersøgelse beror på tre fokusgrupper med 15 deltagere i alt. Fokusgruppeditagerne blev bedt om at diskutere forskellige citater fra interviewene. Disse omhandlede risici, håndteringen af fødevarer, tid siden et produkt gik over dato, og væmmelse. De blev ydermere bedt om at diskutere, hvorfor datomærker sættes som de gør, hvem datomærkerne tilgodeser, og om de stoler på dem.

## Resultater og konklusion

Under interviewene dukkede der forskellige temaer op om risiko for fødevarerbårne sygdomme, produktspecifik risiko, og risikoen ved åbne versus uåbnede produkter. Når det kom til håndteringen af fødevarer, lagde deltagerne vægt på køkkenhygiejne og korrekt opbevaring af fødevarer, samt at sørge for at fødevarer, der var gået over dato blev varmet op før de spises. Dog mente deltagerne at risikoen ved at spise fødevarer over dato var minimal, så længe man brugte sin sunde fornuft når man tjekkede om fødevarerne lugtede fint. Nogle få deltagere fortalte at de følte væmmelse ved tanken om at spise fødevarer, som var gået over deres dato, og de foretrak at smide produkter ud så snart de var udløbet. Til sidst diskuterede de deres 'common sense' forestillinger omkring datomærkerne. De fleste deltagere mente at der var en margin på begge sider af den dato som der angives på produkter, som gør at det er sikkert at spise produkter, der er gået over deres '*sidste anvendelsesdato*'.

Formålet med fokusgrupperne var at udforske de temaer der dukkede op under interviewene. Fokusgruppeditagerne var enige i at, hvor stor risiko der er forbundet med at spise fødevarer, der er over dato, afhænger af produktet. Igen blev frisk kød set som det mest rikable produkt. Yderligere, understregede de køkkenhygiejne og korrekt opbevaring af fødevarer, som måder hvorpå risikoen for fødevarerbårne sygdomme kunne minimeres. Deltagerne understregede også vigtigheden af at bruge sin 'common sense' og tjekke spiseligheden af fødevarer, i stedet for blindt at følge datomærkerne. Det at smide fødevarer ud så snart de var over dato blev set som spild, og fokusgruppeditagerne var bekymrede for både miljøet og madspild. Når det kom til deres opfattelser af datomærkerne, mente fokusgruppeditagerne at de var meget konservative, hvilket betyder at fødevarer sikkert kan spises efter datoen udløber. Dog tilkendegav de at de stadig stolede på datomærkerne, men de foretrak at tjekke spiseligheden af produkterne selv.

## 1. Introduction

Date labels are a key mechanism through which the quality and safety of food products is communicated to consumers. They are supposed to guide consumers, when they make decisions on the edibility of a given product. Date labels should help consumers navigate and balance concerns about edibility and safety of food, both being risks in foods with expired date labels. Currently, two types of date labels are in use in the European Union (EU), '*best before*' and '*use by*', where the first indicates food quality and the latter food safety as illustrated by Fact Box 1 (see Fødevarestyrelsen, 2021a).

*Fact box 1: Date labels and their meaning*

<b>Best Before</b>	<b>Use By</b>
<ul style="list-style-type: none"><li>✓ The Product quality is guaranteed up until this date.</li><li>✓ The product can be eaten past this date, so long as the product smells, looks and tastes as it should.</li></ul>	<ul style="list-style-type: none"><li>✓ The product can safely be consumed up until this date.</li><li>✓ The product should be thrown out once it has passed this date, as the product poses a health risk.</li></ul>

Consumer studies, however, show that consumers do not necessarily understand the meaning of the date labels and tend to confuse which label covers food safety and which label simply refers to the quality of a product (Collart & Interis, 2018; Li, Messer & Kaiser, 2020; Wilson, Miao & Weis, 2018). According to the interview study by Aschemann-Witzel et al. (2015) with experts from the food sector, confusion regarding the meaning of date labels is one the main drivers of food waste in the EU. As such, this confusion may cause consumers to either waste food unnecessarily, because they throw products labelled '*best before*' out, or put them at risk for contracting foodborne illnesses, because they use products labelled '*use by*' after the date on the product has expired.

Consumers' knowledge of the meaning of date labels has been the focus of several reports in Denmark. According to these reports, more than 80 % of consumers are aware that a product labelled '*best before*' can safely be consumed after the date has expired, as long as it smells, looks, and tastes fine. Further, between 70 and 80 % were aware that products labelled '*use by*' pose a health risk after the date has expired (Hansen & Lähtenmäki, 2020; Glanz-Chanos, Friis & Lähtenmäki, 2016; Achmann & Grunert, 2012). However, despite relatively high levels of knowledge among Danish consumers, a report from the Danish Ministry of the Environment (Miljøstyrelsen 2016) shows that on average Danish households throw away 100 kg of edible food per year.



According to Kavanaugh & Quinland (2020), consumer food waste occurs due to various different behaviours; everything from buying in bulk to not using the food in time, or simply not checking the date labels, or the food prior to disposing it contributes to food waste. Studies show that consumers may in fact throw food labelled '*best before*' out once the date has expired instead of using their senses to check edibility (Toma, Costa Font, & Thompson, 2017; Zielinska et al., 2020). However, according to Hansen & Lähteenmäki (2020) 75 % of consumers would use their senses to check the edibility of an expired product labelled '*best before*' before deciding whether to throw it out or not, but 59 % would do the same for a product labelled '*use by*'. As such, it shows that more than half of consumers check the edibility of a product before discarding food products. However, not making a clear-cut difference between the two types of date labels highlights an issue regarding food safety. How consumers handle products has implications on both food waste and food safety, especially regarding products labelled '*use by*'; as these pose a health risk if consumed after the expiration date has passed (Watson & Meah, 2013). As such, consumers need to balance the issue of food waste with concerns regarding food safety, when making decisions about whether to use products. Yet, it seems consumers barely differentiate between the two types of date labels in their practices with food products, despite knowing the difference between them.

Hansen & Lähteenmäki (2020) found that people's self-efficacy (i.e. their confidence in their ability to judge the edibility of a product using their senses) and their perception of the risks associated with eating foods after the expiry date had a significant impact on their intention to throw out a product. But relatively little is known about, how interpreting date labels contribute to consumers' risk perception, nor do we fully understand what role different types of products play together with the time passed beyond the expiry date.

The aim of this study is to explore, how consumers' perceptions of risks develop and change depending on the type of product, and time since the date on the product has expired. We are mainly interested in practices around risk perception and therefore take qualitative approach allowing consumers to decide on what they would do in certain situations and give the reasoning for their actions in their own words.

## 2. Interview study

To gain a better understanding of, how consumers relate to expiring and expired date labels on foods, 15 semi-structured interviews were conducted. During the interviews, consumers were taken through several fictional scenarios related to setting the table and preparing food with expiring or expired foods. The aim of the interviews was to get consumers to articulate their thoughts, feelings, and ideas regarding the date label and using foods past their date, especially related to how their conceptions of risk and their confidence in judging edibility of food affect their decisions.

This chapter includes an overview of the methods used, followed by results, including participants knowledge of the date labels, their understanding of risk, and how handling and self-efficacy affect understanding of risks. Then participants' feelings of disgust are described before moving to how they feel about serving expired food to others. Finally, their ideas and conceptions of the date labels are discussed.

## 2.1 Method - Semi-structured interviews

Semi-structured interviews were chosen, as they afford the consumer an opportunity to engage with various themes (Brinkmann & Kvale, 2015) such as the risks of eating foods close to and beyond their expiry date, as well as allows us to uncover their habits of and attitudes towards eating expired food.

The semi-structured interview guide (Appendix 1) covered three main themes in relation to foods with expiring and expired date labels. 1) How time distance close to and past the expiry date affects consumers' understanding of risks associated with foods, 2) how time point affects consumers' handling of expiring or expired foods, and 3) the role of consumers self-efficacy in relation to making decisions about expiring or expired foods (Fig. 1).

Sections	Themes
Introduction	Knowledge on the date label
Scenarios	<i>Imagine you are at home, preparing X meal, and you take X product out of the fridge. The product is open/sealed, and has been open for X days/has gone X days past its expiry date. <b>What do you do with the product? Do you believe there to be any risks associated with this product? At what point do you start thinking about the edibility of the product?</b></i>
Self-efficacy	<b>How confident are you in your ability to check the edibility of the product mentioned? What about other products?</b>
Date label	<b>Why are date labels put on food?</b>

Figure 1: Overall structure and themes present in the interview guide.

The themes were chosen based on the results of the 2020 study on date labels (Hansen & Lähteenmäki, 2021). According to the report, consumers who associated expired foods with higher risks and had lower levels of self-efficacy, here understood as confidence in their ability to assess the edibility of expired foods, were more likely to throw out expired foods regardless of the type of date label shown (Hansen & Lähteenmäki, 2021). Thus, 15 semi-structured interviews were conducted in order to gain more insight into how risk perception develops and what is the role of self-efficacy in this process.

To anchor interviewees' responses and trigger discussions, they were shown pictures of different products carrying either a 'best before' or a 'use by' label (Appendix 2) and participants were asked to imagine they were preparing foods in their own kitchens at home (Kwasnicka et al, 2015). Specifically, interviewees were asked about risks of eating smoked salmon, yoghurt, chicken and minced meat. These products were chosen as they are products commonly found in shops in Denmark. Further, meat, fish and chicken are often viewed as relatively high-risk products. As interviewees were asked about their opinions and practices, the views and practices that arise from the interviews may be safe or unsafe from an objective food safety perspective. Fact Box 2 shows which date label each of the products had in the interviews, as well as recommendations from the

Ministry of Food, Agriculture and Fisheries of Denmark regarding the safe handling and consumption of selected products (Fødevarestyrelsen, 2021 b).

*Fact box 2: Date label on and correct handling of products used during the interviews*

Smoked fish	Chicken breast
<ul style="list-style-type: none"> <li>✓ Use by date</li> <li>✓ Keeps for up to 2-3 days after opening at 5°C</li> <li>✓ Can be frozen for up to 4 weeks at minus 18°C</li> </ul>	<ul style="list-style-type: none"> <li>✓ Use by date</li> <li>✓ Keeps for up to 2-4 days after opening at 5°C</li> <li>✓ Can be frozen for up to 3-9 months at minus 18°C</li> </ul>
Minced meat	Yoghurt
<ul style="list-style-type: none"> <li>✓ Best before date</li> <li>✓ Should be used on the day it is opened, or be frozen immediately upon opening</li> <li>✓ Can be frozen for up to 4 months at minus 18°C</li> </ul>	<ul style="list-style-type: none"> <li>✓ Best before date</li> <li>✓ Keeps up to 4-5 days after opening at 5°C</li> <li>✓ Should not be frozen</li> </ul>

The Interviews were conducted in June 2021 with 15 participants and lasted between 20 and 35 minutes. All interviews were conducted online due to the Covid-19 restrictions. Prior to the interviews, all participants were sent a consent form (Appendix 3) and agreement was received by e-mail and confirmed verbally at the beginning of the interview. This consent has been stored on a locked computer. Participants were recruited through a Danish market research bureau, with the following criteria:

- As close to 50/50 gender split as possible
- Between the ages of 18 and 65
- At least four participants with children living at home
- Either partially or fully responsible for cooking and shopping
- At least four participants from a large household (more than four individuals living together)

These criteria were chosen to ensure that we recruited interviewees from different types of households, with an emphasis on households with children, as household constellations may have an influence on their praxis around food and food waste (Toma, Costa Font & Thompson, 2020).

Because the interviews were conducted online, we had the advantage of not being limited to one region. Table 1 gives you an overview of the sociodemographic characteristics of the interviewees.

Table 1: Sociodemographic characteristics of interviewees

	Women	Men
Age range	21-54 years	25-53 years
Size of household	2-6 people	2-5 people
No. of large households	3	3
Married or civil partnership	7	7
No. of interviewees w. children	5	6
<i>N</i>	8	7

## Data and data analysis

All interviews were video- and audio-recorded: these recordings were manually transcribed into Danish and anonymised. Anonymised transcripts were then uploaded to NVIVO and analysed using thematic analysis.

Thematic analysis is an iterative, non-linear and non-prescriptive process (Braun & Clarke, 2006; Attride-Stirling, 2001). This involved initial familiarisation with the transcripts, reflections on similarities and differences between cases, and systematic coding of the data. The following analysis is based on these themes which are exemplified using quotes that have been translated into English. These quotes are attributed to gender, man (m) or woman (f), as well as participants' ages.

## 2.2 Results

### 2.2.1: Knowledge of date labels in foods

As part of the interviews, participants were asked if they had any awareness or knowledge of date labels and their meaning. Most interviewees were aware of distinct date labels currently in use, but they only correctly referred to the label 'best before'. 'Use by' was often referred to simply as the expiry date or as "at least lasting till" (*Mindst holdbar til, MHT*), an old formulation of 'best before' label used in Denmark. However, despite not being clear regarding the names of the labels, most participants understood that one label covered the quality of the food, while the other covered safety.

*I know the label called Mindst Holdbar Til (MHT) and best before. That's it. (...) Well, best before, it might say best before the 30-10, well then as starting point it is best before that date, but you can eat it after. If we talk about Mindst Holdbar Til, well if the date is still 30-10, then it only keeps until the 30-10. M, 29*

*Well, one is called Mindst Holdbar Til, and then there is a new one, best before - often good after. (...) Best before, the producer guarantees that the product can be eaten until that date, but it is often fine after. The other, well you shouldn't eat it past that date, I think. F, 38*

Interviewees were aware of the existence of two labels and had sufficient knowledge regarding the meaning of the labels to know their meaning, even if they did not necessarily recall the correct names, this was especially true for the *use by* label. It should be noted that interviewees were told that the correct name for MHT was 'use by', before the interview progressed, as this was the name used in the pictures.

### 2.2.2 Risky or Barely Risky?

Interviewees were asked to identify what risks might be associated with a given product, depending on if the date label in the product had expired or not, had been opened or not before expiry date, and if they would throw a product out or not. Participants identified various risks including risk of illness and the deteriorating quality of food. Many of these risks were associated with specific product categories, whether or not the product had been opened, and the time elapsed since the product expired.

In general, the interviewees saw the fish and meat products as riskier in terms of bacteria and illness compared to the yoghurt. As one person put it, when asked what might happen if they eat yoghurt that had date label expired several days prior:

*I don't think there should be any [health] risks associated with it, it is yoghurt, it has been treated with heat, but the quality might not be as good. F, 38*

Yoghurt was viewed as a low risk product, because it was not a fresh product as some of the others.

*I would say, it would depend on the product type, whether I would eat it past the expiry date. This [yoghurt] is made from sour milk, so it is fermented, like cheese. Had it been a fresh product like a cold cut, it might change it a bit. M, 25*

To most interviewees, health risks were primarily associated with chicken, and most mentioned salmonella as a primary concern regarding the product as a whole:

*We have all heard stories regarding salmonella and things, so I am very attentive towards chicken, I don't want salmonella poisoning because I ate some bad chicken, so in our house we are very attentive toward chicken, and our hygiene around chicken. M, 56*

*I think most people have a fear of chicken, what with salmonella and all those bacteria that might be in such products. F, 23*

*[I would be nervous] that I might get ill eating it [if it has expired]. I would fear getting salmonella or food poisoning. Especially, with chicken. F, 26*

Fish and minced meat were also associated with some risk; however, while participants, for the most part, were unable to identify specific bacteria or illness, they still viewed these products as problematic due to the fact that they were more or less raw:

*I would also worry about bacteria. I can see that this is cold smoked salmon, so it hasn't been treated with enough heat to kill listeria for example. F, 38*

*Well obviously,, if the meat has spoiled, because it has expired, then you might get diarrhoea. You know, feel poorly. M, 25*

However, despite being able to identify risks, and even serious health risk in conjunction with meat and fish, especially once the date label has expired, many saw these risks as minor, describing them as stomach bugs, or simply a rumbling belly. Even if they mentioned more serious consequences, such as food poisoning, they did not believe such things happened often. As this person points out when asked about the risks associated with fish after the date label has expired:

*There is risk with all sorts of foods, your stomach or your body might not be able to tolerate it, because it has spoiled, and you could get salmonella poisonings. But if you just use your common sense, then I don't think it is very likely to ever happen to you. M, 56*

Further, interviewees did not necessarily think they should throw out the food. Here a woman explains why she might not throw out a piece of chicken, even if its date label has expired a two to three days prior:

*I would look at the food, that is the basic principle, and with chicken, I would be more hysterical than I would be if it had been beef or red meat. However, I would never blindly follow the date label. The package is closed, so it hasn't been exposed to the environment*

*and it has been kept in the fridge, so whatever bacteria might have been present [when it was packaged] would not really have multiplied. F, 41*

The woman above speaks to two other important factors influencing people's perceptions of risk. Namely, general handling of products, and whether or not a product has been opened, which we will return to later.

Aside from potential health risk, interviewees most commonly felt that the quality of a product would suffer if it had passed its expiry date, which was a larger issue than potential illness, as one participant explains:

*Most foods that are heated up as they should, I don't think they are riskier than products that have not expired. To me the taste of the food is much more important, there is nothing more annoying than having spent a fair amount of time and effort on cooking dinner, and then the meat tastes off, then you are sat there with only your potatoes and gravy, that is all you have to eat. F, 48*

Additionally, risk was in some way associated with the amount of time that had passed since a product's date label had expired, as one participant explains:

*There is an exponential risk factor to food, the longer it has been open or the longer it is past its date, the less willing you are to take risks. So, if it is just a few days over or been open for a few days, then it really doesn't matter. M, 34*

However, the intervals of time that were seen as acceptable varied widely, not only depending on product type, but also between participants. Some participants followed the date labels to the letter, while others were happy to eat a product well after the expiry date, as long as the product smelled, looked, and tasted, as it should:

*I am just very aware of the dates [on products], I am a bit scared to pass them, so I usually follow them very closely. F, 31*

*I mean, there might be a risk, but if the chicken is only one day over its expiry date, I just don't believe the dates are that precise. I would still use it, if it was only one day past. F, 21*

*I don't care how many days it has been since my yoghurt has expired, the only thing that would make me throw it out, aside from if it smells bad, is if I left it out [of the fridge]. F, 41*

Finally, open products were seen as much more risky than unopened products. Once opened, participants became much more leery of the product, its quality and safety as a whole, and they expressed a need to examine the edibility of the product much more closely as a result:

*This is exciting, because now the package is open. It might not be expired, but it has still been exposed to, let us call it air. It has been exposed to the home environment. Still if it*



*had been in the fridge, and it doesn't smell, or look bad, I would still use it. But with open products I am much more aware of the condition before I use it. M, 25*

Open products called attention to the handling of product at home and to how the handling may potentially increase the risk of illness.

### 2.2.3 Handling, risk and risk mitigating behaviour

The safe handling of products was an important aspect of deciding whether to eat a product or not, irrespective of expiry date. Participants highlighted the importance of hygiene, safe storage, and heating products up as important aspects of risk mitigation. Handling became especially important once the product had been opened, as interviewees saw open products as potentially more risky than non-opened products:

*[I would eat the product], because I know when I opened the package, and I know it has been kept cool, and I know what the date label said. I know how the food has been handled after it was opened. M, 45*

This was not only due to the fact that the package itself has been opened, and been subjected to 'air', as one interviewee put it, but also due to the fact that a product may have been exposed to bacteria when handled, or been subject to temperature changes:

*If it [the chicken] had been properly wrapped and handled, then I would use it, but if it had been left on the table, or someone had had their hands in the package, then I would never use it. F, 26*

The participants had various ways they would mitigate the risks of using products that were either open and/or past their date, including not directly touching products. Another key aspect was the correct storing of products; most interviewees were happy to push past expiration dates, as long as they were sure that the product had been stored correctly, either in the fridge or in the freezer:

*I would have no problem eating [the chicken], as long as it has been removed with a fork, and things haven't been thrown into the package. You can always use one filet, throw the other in a freezer bag and into the fridge, like use the one filet one day, and then the other three days later. M, 56*

*I would never eat the chicken, if it hadn't been closed correctly, because that is a health risk. However, if I had opened it and put it in a freezer bag, closed it and put it in the fridge I wouldn't mind keeping it. But never if it was just open. M, 53*

When it came to using the smoked salmon, interviewees were more likely to continue using a product once opened, if they were able to ensure that the whole package had not graced the dinner table several times, because they were aware that temperature changes spoil the food:

*If it [the salmon] has been on the table, and then in the fridge, and then back out, well then it has had several temperature changes, and that spoils food, some more than others, so I would not eat it if it has been opened for too long, I don't want to risk it. F, 31*

*If the package was past its date, then I would cut something off the salmon, to put on the table, and then leave the rest in the fridge. Then I could throw away the leftovers from the table. However, it would depend on how long it has been on the table. F, 41*

Finally, interviewees were more likely to say they would use an expired product, if said product could be heated up in some way. One participant explained, when asked if he would use smoked salmon 1-2 days past its *use by* date:

*Oh, that is a hard balance, because I would use it if I was making a pie or something. (...) Because, I don't know why, but I think if it is heated, then it is better. M, 29*

Generally, most interviewees expressed the belief that chicken and minced meats could safely be consumed past their dates, as long as they were thoroughly heated:

*[What the minced meat would be used for] would not matter before or on the expiry date. However, after the date has passed, then I would only use it in a dish, where it would be cooked all the way through. M, 54*

*Another aspect [of handling], is how you prepare something, because as long as you heat something up, then you kill most of the harmful stuff, once the product has expired. M, 25*

However, not all interviewees subscribed to this, because they knew that you are not able to do away with harmful toxins just by cooking something:

*Does cooking something through make a difference? Yes, it makes a difference, but I am not worried about bacteria, I am more worried about endotoxins, and you can't cook your way out of them. F, 41*

All in all, participants were aware that their handling and preparing of food had a big impact on, how safe it is to consume a product, expired or not. However, their main criteria for deciding if a food was edible was using their senses and 'common sense'.

#### 2.2.4 Self-efficacy and 'common sense'

During the interviews, participants expressed various ways in which they checked the edibility of a product and their capability to do so, e.g. their self-efficacy. Self-efficacy is an individual's capacity to handle and act in certain situations or questions (Bandura, 1997). To most interviewees, judging the edibility of a product using their senses, especially their sense of smell, was a key step in determining if they would eat a product:

*Generally, if the product has expired a few days before, then I would check it. Does it smell? No. Does it look bad? No. Can I use it? Yes. M, 25*

*I would smell if it smells normal. If it smells sour, then I would throw it out. I would check if it smells normal or if it has changed colour, of course I would check that before using it. M, 29*

*Put your nose in the package and smell: with fish and milk you can always smell if something is wrong. F, 41*

In fact, most interviewees saw this as 'common sense' and reiterated that if you used your senses to judge edibility, it was very unlikely that you would ever become ill.

Despite adequate self-efficacy being emphasised in determining the edibility of food, interviewees varied in how confident they felt in their abilities. Some interviewees expressed full confidence in their abilities to judge the edibility of food, as one participant put it when asked:

*Well, 100 % confident, understood in the way that if I have even the smallest kernel of doubt [about the edibility], then I throw it out. If I have any doubt about [edibility], well life is too short for botulism or whatever you might risk. F, 41*

Most interviewees were only somewhat confident in their ability to judge the eligibility of products, and they were more likely to seek second opinions from others in the household:

*Not particularly confident, to be honest, I often send foods past my wife's nose. Her nose is a shark, she has a very strong sense of smell, so if I don't think something smells, then I pass the product to her, and if she says it smells fine, well that is just double verification. M, 25*

*If I have any doubt, then I get a second opinion from my wife; though, she usually says that if I am in doubt, then something is probably wrong. M, 53*

A few interviewees had no confidence in their abilities to judge the edibility of food:

*I don't trust my ability to judge at all. If you open a package of red meat, I don't think it smells nice, even if you have just opened it, it just does not smell nice, so how would I even know if it was bad. Chicken doesn't smell like much, so maybe I would be able to smell that, but I usually just use it. Salmon, well that just smells like fish, and maybe it would smell more like fish, but I am guessing. Fish still smells really bad. F, 34*

### 2.2.5 Throwing food out on principle

A subset of the interviewees did not truly engage with the topic of eating foods after the date in the label had expired, because they would simply throw out a product, regardless of the date label (i.e. 'use by' or 'best before'). This was not because they thought eating expired food was necessarily particularly risky, but because they were disgusted by the mere suggestion of eating something that was potentially spoiled:

*I would never eat yoghurt that has gone 10 days past its expiry date, not even **one** day. I would never do it. [...] I don't think I would become ill, I just think it is a bit disgusting, and I don't think I would be able to let that thought go. It is just nauseating.* M, 29

*I know I sound like a stickler for the rules with this. It is just that even if the meat was fine, I am sure I would still be able to smell something had gone bad [...]. I am very sensitive with foods, especially meat and milk products and fish. I am certain I would be able to smell, taste or sense something off, [if I knew the product was expired].* F, 25

*Well, I would have the thought that now it has spoiled [because it is past the date], and does it even taste right? And I would be sitting there [while eating] wondering if it actually tastes right. Then it is easier to just not eat it.* F, 31

Aside from the participants who generally refused to use expired foods, others simply had issues with specific products, which generally made them more prone to throwing out the specific food after the date had expired, because they wanted to limit how much they had to touch it:

*Are we talking expired chicken or meat? Chicken I would generally just throw out, but I would smell the meat [once it is past its date]. [...] I am just very cautious of [chicken]. I don't like it very much to begin with, how it feels, how it smells, so I just get nervous really fast.* F, 26

Their unwillingness to use these specific products that had expired was based almost purely on the fear that products would smell or taste bad, not a firm belief that it had actually gone bad. They quite simply felt disgusted by the idea of using these foods and would, therefore, choose to throw products out:

It should be noted that interviewees who said they would throw an item of food away in the context of the scenarios were concerned with ensuring their image not becoming tainted by the prospect of being seen as wasteful. They all spent some time juxtaposing their position on not eating the food with their overall habits around food at home, emphasised how little they actually waste day to day:

*The thing is, I know it is not very fashionable, not to eat things that have passed their date, because we have been told nothing happens if it is just a day past the date, and obviously, you don't want food waste, you don't want to throw all sort of things away. But I don't buy a lot of food, and then let it expire in the fridge. - And having a yoghurt expire, it just does not happen at home.* F, 23

## 2.2.6 Family, friends and eating expired foods

To further gauge interviewees' habits around food with expired date label, they were asked if it mattered to them who would potentially be eating the expired foods. Generally, interviewees framed this as a question of serving expired food to guests, but a small subset did also discuss this in terms of specific family members:

*I am more worried about my kids, I think I would be just fine [eating expired foods], but I have a kid who plays elite football, and they shouldn't risk illness, and not coming to practise, just because of bad food. M, 45*

A number of interviewees, while not having any issue with cooking and serving expired foods to their immediate family, would not entertain the idea of serving expired foods to guests, one man even finding it unethical. Often, they framed their unwillingness in terms of either potentially risking that guest become ill, or because of moral quandaries:

*It matters to me, who is eating. Now for example, if I smell something, and I don't believe it to smell bad or different from what it should, then I would eat it. However, if we have guests coming, then I would just throw it away! I won't risk other people, I might be able to eat it, but I would never serve it. M, 53*

*It makes a huge difference [if I have guests coming], because I feel like, what can I actually allow myself to do? What can I actually serve to my guests? What would I be okay with? M, 29*

However, a number of interviewees saw no issue with serving expired foods to others, rationalising that they had judged it to be safe and edible. They further argued that they would not like to potentially waste food, simply because they have people coming over:

*Well, to me guests don't matter, and I regret having said that on tape, but if I can eat something, then so can my guests. F, 41*

*Doesn't matter. If they can't eat a bit of old chicken, then they will have to find another place to eat. It is food waste and I don't like contributing to that, just because guests are coming. There is no reason to, and they will just be surprised at how good it tastes, even if it isn't fresh. M, 25*

### 2.2.7 Date labels: guidelines or a way to inflate profits?

As part of the interviews, participants either spontaneously revealed or were asked what they believe the function of the date labels to be. Answers ranged from viewing date labels as the date a product began spoiling, to believing they were merely on products to force consumers to buy more products.

A small group of participants saw date labels as the day the product becomes inedible. They believed that food could only be safely eaten up until said date, preferring to throw it out once it has passed. They argued that dates on products were based on rigorous testing of when a given product spoils, often not seeing any difference between a product carrying a 'best before' or 'use by' date label. As a participant explains:

*I believe that there is a reason why food producers write the date they do. I am aware that it is the law, but there must be some research or tests they base this on, I mean testing how long a product can actually keep. F, 31*

Another viewpoint expressed was that the date labels were guidelines meant to protect consumers. Interviewees argued, however, that there was a certain margin in the estimates used, meaning the product might actually spoil a few days before or after the actual date given on the product:

*I think there is a margin in the date the producers set, you just can't control biology so well, and say this date, and no more. - Only electronics break the day after the warranty expires. M, 53*

*I think date labels [including 'use by'] are more guides than anything. Like you can still eat things past their date, because I don't believe that you can be that specific. So it is a guideline to help us, but you don't have to throw the food away. You can always check if it is okay. F, 21*

Participants differed in how large they believed the margin was. Some believed it was based on the shelf life of a product, where products that spoil quickly had a smaller margin and vice versa:

*The shorter the shelf life, the quicker I would use it past the expiry date. But, if you look at a can of mackerel that can keep for three years in our storage, then I would happily use it six months past the expiry date, because I know it has been stored dark and cool. So I always see date labels as guidelines, but good ones as such. F, 48*

Others argued that producers intentionally shorten the shelf life of products to protect themselves against lawsuits and bad press. Meaning a product will always have a longer actual shelf life, despite what the date label says:

*I think that when a producer produces something, then he is very risk averse, and then he says this product keeps four weeks, knowing well it keeps four to five weeks. Better safe than sorry, better this than going to the limit and then risk someone getting ill. Just one shit storm, where someone has gotten ill eating the product. That can ruin a business, so I think*

*they will be safe. [...] I think producers are scared that someone might get ill, so therefore they set very conservative expiry dates.* M, 56

*The likelihood of the product having gone bad two days past the use by date, when I assume that it has this safety margin, is very small, as long as I have stored the product correctly.* M, 34

However, participants who believed that there is a margin generally saw date labels as guidelines, and tended to rely more on their own senses, than the actual date labels to judge the edibility of a product:

*I do look at if a product is labelled best before or use by. [But you say you don't just throw out a product past the use by date] No, I still assess the product. Does it look okay? Does it smell right? You can quickly smell if meat or fish has spoiled, you can quickly sense that.* M, 45

Finally, some participants argued that a product might have a longer shelf life than what the product date label says based on a belief that producers want to sell as much of their product as possible. A shorter than actual shelf life is a way to 'trick' consumers to throw out otherwise edible food:

*I believe that expiry dates are political requirements, and it doesn't mean a product can't keep or has a short shelf life. It just means that there is a guideline everyone can follow. However, I believe many products can actually keep much longer. However, if products keep longer, then we buy less, and then producers make less money. I think there is a definite political motive, and things can keep much longer.* M, 25

Participants' views on date labels tended to vary widely, but only a few interviewees saw the date label as more than simple guidelines. Most interviewees indicated that expiry dates are flexible, which is meant only to be the case for 'best before'. They tended to rely more on their senses than blindly following guidelines related to date labels in their practices.

## 2.3 Discussion

Throughout the interviews, several themes emerged regarding risks, handling, disgust and beliefs regarding the date labels. These included risk of illness, product-specific risks, and risks related to open versus unopened products. When it came to handling, participants emphasised kitchen hygiene and appropriately storing food products, as well as ensuring that expired products are heated up before consumption. A few participants discussed feelings of disgust in relation to eating expired foods, and preferred disposing of food past its date. Finally, interviewees discussed various 'common sense' beliefs about the date label. Most prominently the belief that there is a margin of error on both sides of the date given, which allows them to safely consume foods past their *'use by'* date.

When asked about potential risks associated with the four products used (yoghurt, chicken, smoked salmon and minced meat), interviewees generally knew that eating spoiled food can cause stomach upsets. Some interviewees were even able to name specific bacteria causing illness, especially concerning chicken. Further, participants viewed opened products as more risky than non-opened ones, due to the fact that bacteria could have contaminated the product and it also mattered to them how much time had passed since the product date label had expired. This, however, varied between products and participants, with some interviewees willing to try products several days past the date and some unwilling to go even one day past. Handling was seen as key aspect of both potentially adding to and mitigating the risk of foodborne illness. However, risks were generally seen as both surmountable and unlikely to happen, if people used common sense when handling and judging the edibility of a product. Given that the interviewees were aware of the potential risks associated with eating food beyond the expiry date, especially products carrying a *use by* date, it seems odd that they were so willing to follow their own judgments rather than food safety guidelines. However, this may be due to a phenomenon known as optimism bias.

Optimism bias is a cognitive bias that causes individuals to believe they are less likely to experience a negative outcome of a behaviour, i.e. contract a foodborne illness from eating expired food product. Optimistic bias can be observed across all cultures, ages and genders, and is resistant to change, often remaining the same, even in the face of disconfirming evidence (Sharot, 2011). This means that if a person estimates their likelihood of contracting salmonella from chicken with expired date label being highly unlikely, they will not change this estimate even when they are confronted with evidence of that the likelihood being higher (e.g. 25 %). However, if their initial estimate was 50 % and they are shown that this is closer to 25 %, they will likely downgrade their subsequent estimations to fit more closely with the new information. As such, simply providing consumers with information regarding the risks and likelihood of contracting foodborne illnesses is unlikely to have the desired impact on behaviour. However, although interviewees did not speak directly about food waste as a concept, they were concerned about not appearing wasteful. This may have exaggerated their reported willingness to use foods long past their expiration date. This



phenomenon, termed as social desirability bias, may lead individuals to change their answers to appear better than they are, in this instance less wasteful (King & Bruner, 2000).

While risk was unlikely to prompt interviewees to throw food out, harbouring feelings of disgust towards food products when the date label has expired was a clear reason given by interviewees for throwing food. These individuals with strong feeling of disgust said they throw out food once it has passed its date, irrespective of the date label the product carries. Disgust is mainly based on sensory experience and the possibility of unpleasant experiences when eating. This type of behaviour is generally linked to food waste, and the interviewees were aware of the possible conflict with their behaviour and need to avoid food waste, in the interview they pointed out that this behaviour might be viewed negatively by peers and were quick to point out that they do not waste much food at home.

As such, consumers seem to fall onto a spectrum when it comes to interacting with date labels. On one end, there are consumers who throw products out as soon as the date has passed due to finding the prospect of eating expired food disgusting. On the other end, there are consumers who rely almost exclusively on their own senses over the information carried by the date labels, which can result in overconfidence. This overconfidence can be dysfunctional when the products are labelled 'use by' and potentially contain a health risk once the date in the label has expired. In the middle, there are consumers who believe that there is some margin inherent in dates given, but they use caution and sense when it comes to judging edibility. How participants used the date label did not only rely on their confidence in judging edibility of products or feelings of disgust. Interviewees had certain ideas about how and why date labels are used on products, which help them evaluate why they follow or don't follow the guidance within.

Interviewees, who tended to throw products out on the date of the label, were more likely to see date labels as guidelines that have been set based upon extensive testing of a product's actual shelf life. Those who used both senses and caution believed that there was a margin for error on both sides of the date given. This was either due to the natural variability of biological materials or done to protect producers from potential bad press. Some even suggested that shelf lives are intentionally shortened to drive consumers to buy more products. Finally, those who relied almost exclusively on their senses were more likely to see date labels as something simply required by law.

### 3. Focus group study

The aim of focus groups was to explore further the themes and opinions uncovered during the interviews. We aimed to gain broader views and opinions of eating and serving foods after the date label has expired, as well as to gain a better understanding of, how consumers view date labels. Findings from interviews were used as stimuli in focus groups in order to find out how consumers discuss and reflect on different viewpoints.

The first part of the chapter is an overview of the methods used during the focus group. Then the results on participants' understanding of risk, practices related to handling foods and perception of time distance from expiry date are described followed by issues related to disgust and to whom the food is served. Finally, their ideas and perceptions of the date labels are discussed.

### 3.1 Method – Focus group discussions

Focus groups differ from previous one-on-one interviews in that they are a collective act that can access group norms, collective opinions and shared knowledge, in other words, more shared opinions of and experiences with expired date labels and foods (Whitley, 2005).

The focus group guide (Appendix 4) was designed based on the opinions and themes uncovered during the interviews and covered three main themes in relation to expiring and expired date labels on foods. 1) Risks associated with expired foods 2) consumers self-efficacy in relation to expired foods 3) trust in and opinions of the date labels (Fig. 2). Discussions in these themes were stimulated by presenting short statements describing findings from previous interview studies. These statements were formulated as taking a strong stand to elicit discussion. In essence, rather than asking the focus group participants what the risks of expired foods were, we asked them to instead discuss the veracity of different statements made by interview participants. For example, rather than ask them if they would serve expired foods to guests, they were asked to discuss the following quote: *In my opinion, if I can eat something, then so can my guests, it doesn't matter if the product has passed its expiry date or not* (translated from Danish). This was done to further elaborate the thinking consumers have in relation to date labels and ensure that the themes from the interviews were discussed.

Sections	Themes	Questions
Introduction	Icebreaker	
	<i>Risk of illness</i>	<p><b>S<sub>1</sub>:</b> I don't believe there are any health risks associated with eating food that has gone past its date. Normally nothing happens.</p> <p><b>S<sub>2</sub>:</b> Seeing as it is food, well if you eat something that has gone too far past its date and has spoiled, then you will get a stomach-ache. Then it has to come out again. That is what might happen.</p>
Statement	<i>Quality issues</i>	<p><b>S<sub>1</sub>:</b> I don't really care about the quality of the food I eat; I have eaten things that were fairly old in the past, but I had already put it in the pot, and then, well if it goes it goes.</p> <p><b>S<sub>2</sub>:</b> When I notice a product has expired, then I would think that it has spoiled, and then I would wonder if it would taste bad. It is just easier not to eat it then.</p>
	<i>Feeling disgust</i>	<p><b>S<sub>1</sub>:</b> If the date has expired, then the food is spoiled, and then I just can't make myself eat it. Just the thought, gross!</p> <p><b>S<sub>2</sub>:</b> I always taste and try different foods, no matter what the date label says, even if the food has begun looking unappealing, i.e. brown spots on apples.</p>
	<i>Handling and cooking foods</i>	<p><b>S<sub>1</sub>:</b> So long as the product has been handled correctly, then I would eat it even once the date has expired, but if it has been left on the table too long, then I would never eat it.</p> <p><b>S<sub>2</sub>:</b> Another thing is how you cook something, because if you heat something up, then you kill some of the bacteria, which might be present in a product that has expired.</p>
	<i>Serving expired foods</i>	<p><b>S<sub>1</sub>:</b> If I had invited guest, then I would never serve food that has gone past its expiration date. That is unethical; you can't invite people, and then serve expired foods.</p> <p><b>S<sub>2</sub>:</b> In my opinion, if I can eat something, then so can my guests., it doesn't matter if the product has passed its expiry date or not.</p>
	<i>Self-efficacy</i>	<p><b>S<sub>1</sub>:</b> The problem with expired foods is that you might not necessarily be able to smell the bacteria present, and you can't necessarily smell the endotoxins. So, you can risk becoming very ill.</p> <p><b>S<sub>2</sub>:</b> Generally, if a product has expired, then I would check it. Does it smell? No. Does it look bad? No. Can I use it? Yes. You can almost always tell if a product can be used by looking at it and smelling it.</p>
	<i>Time past the date</i>	<p><b>S<sub>1</sub>:</b> I begin doubting the food, once it has gone 2-3 days past its date. Is it still okay? Isn't that a bit too much time past?</p> <p><b>S<sub>2</sub>:</b> After a week, I would start thinking about the edibility, if it hasn't gone a bit too much past the date, maybe even if it hasn't begun spoiling.</p>
	Date label	Knowledge of the date labels
Beliefs regarding date labels		<b>Who or what do date labels favour? Who or what influences the date labels?</b>

Figure 2: Overall structure and themes present in the interview guide.

To anchor the responses of the participants and trigger discussions, pictures of different foods were placed on the table during the entire focus group (Appendix 5) (Kwasnicka et al, 2015).

To gauge participants' trust in and opinions on the date labels, participants were first given a short overview of how products are date labelled in Denmark, based on guidelines from the European Union (Appendix 6). They were then presented with four actors (consumers, stores, producers and the ministry of health) and asked whom they believed to benefit most from date labels and why, why they believe products are labelled as they are, and if they trust the labels. During this discussion a decision tree regarding date labels, as well as pictures of the four actors with their names were placed on the table for participants to use as well (Appendix 7).

Three focus groups were conducted in the first week of August 2021 with each group containing 5 participants (15 participants in all) and lasted from 60 to 85 minutes. All focus groups were conducted on Aarhus University's premises and complied with the Covid-19 restrictions. Prior to the beginning of the focus groups, participants were asked to fill out a consent form (Appendix 8), to ensure they understood, what data would be collected, and how it would be handled going forward. Consent forms were stored in a locked drawer until the end of the reporting period. Participants were recruited through a national Danish market research bureau, with the following criteria:

- As close to 50/50 gender split as possible
- Between the ages of 18 and 65
- Either partially or fully responsible for cooking and shopping
- At least four participants with children living at home

This was done to ensure that we recruited interviewees from different types of households, with an emphasis on households with children, as household constellations may have an influence on their praxis around food and food waste (Toma, Costa Form & Thompson, 2020).

Table 2 below gives you an overview of the sociodemographic characteristics of the participants.

Table 2: Sociodemographic characteristics of participants

	Women	Men
Age range	23-56	22-50
Size of household	2-5	1-5
No. of large households	2	3
Married or civil partnership	8	3
No. of participants w. children	4	3
<i>N</i>	9	6

### Data and data analysis

All focus groups were audio recorded: these recordings were manually transcribed into Danish and anonymised. Anonymised transcripts were then uploaded to NVIVO and analysed using thematic analysis.

Thematic analysis is an iterative, non-linear and non-prescriptive process (Braun & Clarke, 2006; Attride-Stirling, 2001). This involved initial familiarisation with the transcripts, reflections on similarities and differences between cases, and systematic coding of the data. The following analysis is based on these themes, which are exemplified using quotes that have been translated into English. Quotes are attributed to the gender of the participant (either male (m) or female (f)), their age, and which focus group they belonged to (FG).

## 3.2 Results

### 3.2.1 Risks, handling, and time

To gain a better understanding of, how consumers relate to the risks identified during the Interviews, focus group participants were asked to react to various statements regarding foodborne illness, product quality, time past the expiry date and handling of foods at household.

Participants did not identify any specific risk associated with expired foods, but they were aware that some products are riskier than others, when asked to react to the claim that there are no risks associated with eating expired foods:

*That really depends on the product. F, 26*

*But as a rule, they are right. M, 22*

*But I just think that milk and meat products would be problematic, depending on if it is fresh or frozen. I think I would be very careful with milk products. F, 26*

*I think I would be most careful with meat. With milk products I am more scared it would become disgusting, but like, I think you can drink sour milk, if you want to, I don't; but, from a health standpoint, I believe meat to be more dangerous. However, I would always assume there was no risk, if it was only just past the date. You can always judge something by smell and look. M, 22*

Conversation between two participants, FG1

This idea that especially meat products carry a risk once they have passed their expiry date was echoed across other groups as well. As one participant put it:

*It is often the quality of a product that suffers, unless it is something that can swim or fly, then it is simply the quality that suffers. If it can swim or fly, then you should never experiment with it, but most other things just smell and look at it. M, 46, FG2*

It is clear, that to the participants that most products with expired dates simply suffer from reduced quality, while few carry the risk of stomach pains and food poisoning. However, participants tended to view the risks as fairly small, so long as one uses one's senses to evaluate edibility:

*I would say, if I had evaluated that there was nothing with a product and ate it, and if I had had a stomach-ache then that is just what happens. It is my own fault for eating it. F, 26*

*If it had spoiled so badly that I got a stomach-ache, then I think I would have stopped before that point. You know because of the smell or consistency. F, 38*

Conversation between two participants, FG1

Further, food poisoning was seen as an extreme consequence of eating spoilt food, as one participant explains:

*I think we are far out, if we are talking food poisoning, that isn't where we start. When I hear the words food poisoning, then you need medical assistance. But you can have eaten something, where you don't feel great afterwards, feel a bit unwell, have a rumbling stomach. M, 44, FG1*

Product type did not only matter when it came to the general understanding of risk, it also mattered when discussing how long a product could go past the expiry date, before being viewed as inedible. As participants described when they were asked to react to the statement "I begin to doubt the edibility of a product once it has gone two-three days past its date":

*It depends on all of those things we have spoken about, which product it is. So, yeah, if it is minced meat, I would probably throw it out after two-three days. M, 22*

*It depends on the product, if it is something that is a health hazard or just something that might not be as nice. So, if it's oats or biscuits, then I don't care. If it's a product like meat or fish, then I am much more careful. F, 26*

*Generally, it depends on what it is and how it smells, in our house we don't care that much about the date. You can be unlucky and it has spoiled before the date has expired. M, 44, Conversation between three participants, FG1*

Further, participants saw the time past the expiry date as somewhat dependent on the shelf life of the product, where products with a short shelf life were seen as spoiling faster than products with a long shelf life:

*You could say that if it something with a short shelf life, so like milk products and meat, I would never eat them if they were more than a week past their date, but if it is mayonnaise, which keeps for four months, or pasta, or something dried, then I wouldn't even think about it. M, 46, FG2*

However, participants' risk perception was affected by how the products were handled, and participants in the focus groups focussed not only on the potential risks associated with handling the food at home, but also throughout the supply chain.

Participants in all the focus groups spoke about how the handling of the products in different stores has an impact on, whether or not they perceive any risk with a product. Generally, they trusted that products are handled correctly throughout the supply chain, but if a store seemed unhygienic or untidy, it affected their trust in this.

*I think that the impression of a store impacts if you. If it is messy and the like, then you start doubting if they know what they are doing, and if they actually have date labels and handling and storage of food under control. F, 26*

*I just think, we have the smiley scheme, which helps us know that they store and handle food correctly, so we don't get ill. Then we can say it is our own responsibility when we buy*



*food close to the expiry date. After we put it in the fridge at home, it is at our own risk. M, 44*

Conversation between two participants, FG1

Some participants also pointed out that there is a difference between buying something in a store that is close to expiring and having a product close to expiry date after storing it in the fridge at home for seven days:

*I think, once you bought something, if I buy meat and it keeps for a week, and I have had it in my fridge for a week, then I think it is more spoilt than if I buy it as on the date. Even though I am hysterical when transporting it home, I mean I have everything in the car to ensure it stays cold, and I don't think I handle it wrongly. I just think it starts spoiling quicker at home. F, 56*

(...)

*I have this hypothesis that my fridge isn't very good, so all my food is stored on the bottom shelf, so I don't trust it like I do the supermarket [fridge]. M, 27*

*Also, you take it out, and the fridge gets opened and closed. F, 56*

Conversation between two participants, FG3

The key differences between the store and the home was the fact that stores have various protocols in place to ensure food safety; their equipment was viewed as better than what the participants have at home and they felt products were handled much less in stores. At home products might experience temperature changes or be moved in and out of the fridge when members of the family were going through the fridge. Finally, several participants noted that the way in which we transport our food from the store to home has an impact on food safety as well, at least when talking about fresh and frozen products:

*When it comes to fresh products, meat and such, if it has been travelling for a full afternoon in the back of a 50°C car, and you just bought chicken at the first place you shop, or you just leave it on the kitchen counter when you get home, and leave it for a while because you are busy. I would be hesitant with it, and very vigilant. M, 48, FG2*

Once at home, most participants viewed leaving food out on the table for long periods to be a main contributor of risk, depending on the product in question:

*I have some friends, who are terrible at leaving the milk out on the table, and I know it can have been left there for a long time. In that scenario I would be more critical of the date, it must have been shortened, so it means a lot, how people handle the food at home, and if I don't trust them, then I am more critical. M, 22, FG1*

*I would never eat something that has been left out on the table for a long time. Never. F, 32, FG3*

Some participants found that if the product was thoroughly heated it did not matter much to them, if it had been left out. However, the belief that heating a product is a way to mitigate potential risks with products that have been left out from fridge or had expired date label, was not one that was held by very many participants. Instead, they focussed on self-efficacy to ensure that food was edible before cooking, or to throw it out if they were in doubt or something was visibly wrong with the product:

*It depends on the product, is it something I reheat completely, then I am not particularly critical. However, if it is something like cold cuts that has been left out for half a day, or has been in and out of the fridge repeatedly, then I am much more critical. F, 26, FG1*

*There are harmful bacteria in there where you need to reach at least 120°C, and I don't think very many kitchens have the capacity to reach that temperature when cooking the food. I would never dream of saying this chicken probably fine or this grey meat, it doesn't matter if we just cook it. F, 52, FG2*

### 3.2.2 Self-efficacy, 'common sense' and experience

As with the interviews, self-efficacy, as the ability to judge the edibility of a product using only ones senses, was seen as a key skill, both to protect oneself from potential illness, and to avoid edible food waste. However, the focus group participants further discussed how self-efficacy develops through experience.

Generally, self-efficacy was the main way participants protected themselves from potential foodborne illness. As can be seen when participants discussed the statement “Generally, if a product has expired, then I would check it. Does it smell? No. Does it look bad? No. Can I eat it? Yes.”:

*I am somewhat in agreement with what is said. I am not too worried that it [expired food] is a health risk, there I just think, well does it smell bad or well good? Does it have a weird consistency? Well then I would never touch it, regardless of if it in date or not. M, 25, FG3*

*I have changed my ways, stopped uncritically throwing food away [when it expires], to checking if I can still use it, and be a bit more generous with it [dates]? Not because of sustainability, but more because there is no reason to throw something away that you can still use. M, 44, FG1*

As with the interviews, using your senses to judge edibility was described as simple common sense. However, despite the fact that using your senses was a key aspect when judging edibility, participants were aware that it is harder to sense edibility of some products:

*Now you mentioned fish and shellfish earlier. I avoid shellfish like the plague, if I am not entirely sure it is okay, because you can get really ill, and maybe there are no warning lamps. M, 48, FG1*

For products that were seen as riskier, participants agreed that one needed to be more careful with them, and several participants further linked this with the date labels:

*It is correct, you can't always smell if there is bacteria, and as far as I know these products carry a use by date, so that you know there is something with bacteria.* M, 36, FG3

However, for most participants this just meant that they were more critical towards certain products, when checking them; this did not mean they would not use them after the date has expired:

*I am fairly critical with meat, I just feel more concerned with it. It need not be particularly far beyond the expiry date before I get suspicious of meat and fish.* F, 38, FG1

Another key aspect identified was how self-efficacy develops. Because participants were able to draw upon experience to use food that might normally be considered to be spoiled:

*I think it changes, what you consider spoiled. In my house we have always just cut the mould off the cheese, I don't think that is recommended.* M, 24

*I don't think they do, but the cheese is just fine. Obviously, it depends on the product type, (...) but I also believe it has to do with, how you are raised, and the experiences and knowledge you have gained over time.* M, 50

Conversation between two participants, FG2

*I think, if you have tried it before, because if you have stood there, I need cream, but it is two days past! Well, guess I'll try. Then you taste a little and find out that it was just fine, and you are not in doubt, because if it is sour, well then. I guarantee you there is a dressing that is expired in my fridge, but I don't use it enough to justify buying a new one, and it is fine.* F, 52, FG2

*I think it depends on your experience with different products. For example, yoghurt is edible several days past its expiry date.* M, 27, FG3

Participants agreed that with experience, one learns what products will most likely be fine and for how long, making one less reliant on date labels, as it becomes easy to tell if something might have gone off based on one's senses. However, some participants questioned this, as one cannot always tell the product quality purely based on taste and smell, which makes it harder to learn from potential mistakes.

*I don't think it is always that easy to know, if you get a stomach-ache, what food might have caused it.* F, 26

*Right? It's hard to learn from. Yes, fine I had some discomfort today, but that could be due to all sorts of reasons. I might be stressed or nervous. It is hard to know, especially if you haven't actually registered that the food was bad. If you consciously decided to eat*

*something you weren't sure about, then it makes sense to connect it. If you haven't, well then it is difficult to know what caused your illness.* M, 22

Conversation between two participants, FG1

### 3.2.3 Throwing products out on principle – that's just wasteful

When asked to react to quotes regarding feeling disgusted by foods with expired date labels, participants expressed that they themselves did not feel any disgust regarding eating expired foods, but that they were aware of people who feel that way:

*It's the same answer again, and you will have to write this down a lot, but if it tastes fine, smells fine, then I just use it. Dates don't scare me.* M, 36, FG3

*We have a teen at home, if something is close to the date, then she won't touch it. We can tell her it doesn't matter but... So, I understand that some people might feel that way, but again, just use your common sense.* M, 48, FG2

While participants generally agreed that they would never just throw out food because the date label had expired; one participant still expressed worries and disgust with specific products, such as bread:

*When it comes to bread, I am a bit sensitive, because spores are present before you can see or smell it, so bread it goes in the freezer. (...) I think I have some sort of fear, this thing with eating mouldy bread. I just can't stand the thought.* F, 26, FG1

Most participants saw the concept of disgust primarily as wasteful and the issue of food waste was at the forefront of the participants' minds throughout the focus groups. They often mentioned various food waste initiatives such as *Refood*, *Too Good to Go*, and various campaigns regarding date labels and fighting against throwing food away:

*I think we have some generations now that are much more conscious about waste, that we shouldn't just look in the fridge and throw half of it out, just because it expired two days ago. It has changed completely because we are much more aware of the environment, resources, and overconsumption. I think it has opened their eyes, I was very conservative in my youth, but young people today are much less likely to be scared of these dates and whatever.* M, 50, FG2

*I have begun checking more, because I remember there was a campaign that you shouldn't be so critical with dates in relation to food waste and such, and they had changed some of the labels like *Mindst Holdbar Til* and such.* M, 44, FG1

Several participants denied ever throwing food away just because it was past the date, emphasising that they are good at using things in time, as seen in this exchange:

*I would never throw away something that has expired, just on principle; I would always check it first.* F, 26

*I also just think that I am very good at using what I buy, so I never have too.* F, 26

Conversation between two participants, FG1

### 3.2.4 Friends and serving expired food

When asked to react to quotes on social risk, specifically around the ethics of serving guests food that has expired date labels. Surprisingly, participants found that it was perfectly okay to serve expired food to guests, so long as one deemed it edible:

*If I had looked at it and thought it looked fine, then I would serve it to my guest, I make no difference.* M, 48

*Me neither, if a sour crème dressing had a date of 22-7 now we have 7-8, well if it tastes fine, then yes.* F, 52

*Of course some people have weaker stomachs than others, but mostly nothing happens. I would make no difference.* M, 50

*You would never serve something you wouldn't eat yourself.* M, 24

Conversation between four participants, FG2

*I think, well, you wouldn't serve food to others you wouldn't eat yourself, so if you can vouch for the food you cook, then it doesn't matter.* F, 27, FG3

Participants did note though that they would be more critical than normal when serving guests and that certain products might be riskier, or not taking the risk with some guests. But again, they tended to rely on self-efficacy:

*I think, that if I would eat it, then it is fine, I don't try to give myself a stomach-ache. If I believe it is fine, then I would serve it.* F, 26

*I agree, but it depends on the type of product. I would be more critical, it shouldn't be said that I gave people salmonella, but you can be tolerant with some things.* M, 48

Conversation between two participants, FG1

*As long as you still know, well it doesn't smell, it's not gross, it isn't bad in that sense, and it has been properly prepared, then it is just as good as any other food. The guest are just happy to be fed good food, right?* F, 49, FG3

### 3.2.5 Date labels: use, beliefs and trust

The three groups spent some time discussing various aspects of the date labels. Unlike the previous sections, these discussions were not based on quotations from the interview, instead participants were asked open-ended questions regarding when and why they used them, who they imagine the date labels protect, and finally if they trust the labels.

When it came to using the date labels, participants in the focus groups agreed that they mostly look at the dates while shopping in the store to ensure they do not accidentally come home with products that cannot keep until they need to use them:

*It depends on when and how I am planning to use it, if I am planning to use it immediately, then I don't mind buying the milk close to expiring, but otherwise I would like to have the ones with the longest shelf life, so I mind the date labels when I shop. F, 49, FG3*

*Well, I look at them a lot, because when you buy bread, you so often end up bringing home a loaf that can only keep for another three days. So, I use them a lot, but I am capable of making a choice. If I am picking up milk, then I don't care that one of the cartons expires two days before the others, I just make sure that one is at the front in the fridge. F, 52, FG2*

Further, for some participants, labels were also used at home to make sure food products were used in order of the shortest to longest shelf life, to avoid wasting products and having to change meal plans on the fly, due to ingredients being spoiled:

*In principle I always buy products with the longest shelf life, and then when I come home, well then I always use the product with the shortest shelf life first. M, 46, FG2*

Some participants did find it hard to control, how things were used, once products have been put away at home, as is captured in the below exchange between participants:

*I think you are right, it matters when you plan to use something. If I know I am going to use the product within the next few days, then I don't want to waste time trying to find the stuff with the longest shelf life, because the cold cuts have all been used on the kids lunches within the first three days, then it just doesn't matter that much. M, 48*

*Problem is though, the minute everything has been put away, and everyone has the run of the kitchen, then no-one checks dates anymore, they just grab whatever is at the front, and then suddenly you have a milk three days past its date. M, 46*

*I control that, by putting the carton with the shortest date at the front. F, 52.*

Exchange between three participants, FG2

This exchange highlights a few different aspects of how date labels are used. Firstly, it seems consumers focus more on date labels in shopping situation than once the product is stored at home. Secondly, that date labels are most important in the context of ensuring that products can keep until they are needed. If participants judged that they would use the product quickly, they were less likely to check them. This did not exclude them from buying products with short shelf lives, but they expressed that this was only attractive if they were "paid" for this in the form of discounts.

Another aspect of this was the product type. Participants almost never checked the labels or shelf life on products like fresh fruit and vegetables, or products such as pasta, rice or canned goods:

*Yes, because someone might have mistreated [the fruit] on the way, an angry employee might have thrown it, and even if it is fresh, there might still be a rotten tomato in the package. But I have never looked at the date on a can of beans, in my mind it lasts forever. But in the frozen or refrigerated counter I do look. It has something to do with the product, and somehow you just don't think about the fact that they [fruit, veg and canned goods] carry an expiry date. M, 48, FG2*

One participant even went so far as to describe dates on products like flour, sugar and pasta as fictitious, indicating that in consumers' minds, certain product types need not carry dates at all:

*A lot of dried products, it has to be a fictitious date, you know pasta, flour, sugar, that can keep almost for eternity. When they do archaeological digs in a 1000 years, then they will find a package of pasta, and it is probably still perfectly edible. M, 46, FG2*

Finally, it is worth it to note that while participants did check expiry dates regularly, this did not necessarily mean that they notice whether a product carries a *use by* or *best before* label:

*I am more generous with best before and Mindest Holdbar Til, than I am with products carrying use by labels. Because it is something you see on meat, fish, things like that, and then you really should not eat it later than that, after that it is at your own risk. (...). F, 26*

*I use that as well. M, 22*

(...)

*I never think about that, I have never noticed that there was more than one label, I just look at the date, and then I think, that is fine. F, 38*

Conversation between three participants FG1

All in all, usage of the date label seems to be predicated on product type and meal planning, date labels were more likely to be checked at the store than at home and while all participants check dates to some degree, not all of them actually take notice of the type of date label a product carries.

When asked about whom the date labels primarily protect, all focus group participants agreed that they are primarily there to ensure the health and safety of consumers:

*I believe that with foods, then the primary objective must be protecting consumers; making sure that there aren't any epidemics or illnesses constantly cropping up. With Covid-19, there have been fewer stories of foodborne illnesses, due to the heightened focus on hand hygiene. When talking about foods, then the health and safety of consumers must be paramount. M, 44, FG1*

However, despite seeing date labels as consumer protection, participants still argued that producers must be setting the dates conservatively, so as to protect themselves from potential bad press:

*Producers have to be conservative with the dates, if they just put some random date and people fall ill, then they will be in trouble, and the food ministry would punish them, and get put on the front pages of all sorts of newspapers. They have to be conservative, and then it is up to people to decide if they are willing to use the product. M, 48, FG2*

One participant took this a step further and spontaneously suggested that producers actually wanted to 'trick' consumers into buying their product more often, using a significantly shortened shelf life to do this. However, this was not a view held by any of the other participants in his group:

*You could say that producers also have an interest in the shelf life being as short as possible, because then people will buy more of their products, although they would also throw more out. However, if we are a bit more cynical, then I think that can be one of the reasons why. I have also heard that there are dates on products that keep for much longer, because producers want us to buy more of their products. Like electronics, which are designed to break after so and so many years. Therefore, producers might put dates on products that cause us to buy their products more frequently. M, 22*

*I don't think I have ever heard that very often. F, 26*

Conversation between two participants FG1

Some participants felt that date labels were mostly present due to strict laws regarding dates in Denmark:

*Products have to have an expiry date, otherwise we risk dying, but things don't just expire like that [snaps fingers]. F, 32*

*But then, isn't it just the law that they have to put a date on a product, but it keeps much longer. F, 49*

Conversation between two participants, FG3

While all participants saw date labels as a protective measure to ensure the health and safety of consumers, there was, still the general sense that dates are conservative, and products keep much longer. This was further illustrated with examples from participants who had witnessed this:

*I think that meat, I am more careful with, but bread, I used to package bread, and at one point one customer wanted a specific date on the packages, and it was almost the same bread that we packaged, but we are a lot more hysterical with dates in Denmark than the UK, where the bread kept for another week. M, 36, FG3*

*For eggs, the eggs we have in Denmark that are also sold on Greenland, well they keep for three months from the date they are packaged, but in Denmark they only keep for three weeks. They are the same eggs, from the same producer. F, 52, FG2*



Despite the fact that all participants agreed that there is a margin on dates, they still tended to believe that dates are set on the basis of tests of the shelf life of various products:

*Well, it is more protection if the shelf life is short, because then the products don't actually spoil.* F, 26

*Yes, a balance between lessening food waste and lessening the health risk, and whatever interests are present.* M, 22

*I hope they set dates based on testing the shelf life of products. I hope they test that a liver pâté keeps for this long, and eggs this long.* F, 26

*So do !!* F, 38

Conversation between four participants of FG1

*I assume that they have done some tests, so they know when things spoil based on the production time and methods used, so that they know when the bacterial content gets too high. I don't believe they just stick a finger in the air. So, it is probably based on tests, experiments, and measurements.* M, 48

*I hope so at least!* M, 46

Conversation between two participants in FG2

A final aspect that may affect consumers' use of date labels is whether they trust the information carried by the label or not. Despite believing that the shelf life of products is longer than the expiry dates would have them believe, participants still agreed that they are to some extent based on tests. This means consumers may generally believe that shelf life is intentionally shortened to protect the consumer from illness and the producer from litigation. Generally, this belief does not seem to negatively affect their trust in the date labels, but as seen below participants prefer to use their own judgments:

*Yes, you trust them, but then you still use products past this date, so you don't follow them blindly. You trust they are set as they are, because they [the producers] expect the food to at least keep until then, and beyond that, it is up to you and your critical sense and how much you want to eat it, that affects whether or not you throw it out. So, on one hand I trust them, but then on the other I never throw things out just because it says I should.* F, 38

*I prefer the dates to be set too early rather than too late. So I blindly trust that a product can keep until the expiry date, and after that it is my responsibility, and if it has gone grey in the refrigerated counters, then I assume something went wrong with the handling of the product [in the supply chain]. Basically, I trust them, but first and foremost I trust my own judgment.* F, 26

Conversation between two participants, FG1

Consumers seem to trust the information carried within the date labels, but prefer to use their own senses to assess the final quality based on the knowledge that this final quality depends on how a product travels through the supply chain:

*I believe producers have everything fully under control, until the product leaves their property, then you have the distribution firms, and they might have done what they can to keep with it [health and safety regulations], but then a frivolous store employee left the pallet outside in the sun. Then as consumers, we can no longer trust the information on the label, because they might have managed to put the meat in the freezer before it turned brown. We kind have to trust it, but we can never be sure about the full supply chain, and you do hear stories. M, 38, FG2*

### 3.3 Discussion

The aim of the focus groups was to further explore the themes that emerged during the interviews.

When talking about risk focus group participants saw it as product dependent. Specifically, they identified products like fresh meat, fish, and chicken as riskier than other products. Participants further discussed potential risks of eating such foods after the date label has expired, including foodborne illnesses such as stomach aches and food poisoning. However, as with the interviewees, the focus group participants saw risks as surmountable and very unlikely to happen, as long as consumers use common sense when judging the edibility of a product. Focus group participants also agreed that using your senses, especially sense of smell, was a key to ensuring the edibility of a product. They further discussed the importance of experience in relation to self-efficacy. To the focus group participants, experience with foods in relation to edibility helped them to know how far they could push a product past its expiry date. However, several participants pointed out that it can be hard to learn from experience, as you might not always be able to attribute illness to eating an expired product.

Unlike the interviewees, focus group participants did not throw food out due to feelings of disgust, although several participants knew people who did. Rather, participants saw this kind of behaviour as wasteful. The issue of wastefulness and food waste came up several times during the focus groups. Both as general discussions of the environment and as mentioning examples of how little the participants themselves waste day to day. As such, it seems that any discussion on date labels is intrinsically linked to issues of food waste in consumers' minds.

Participants in the focus groups reiterated several 'common sense' beliefs about when and how dates in labels are set. Focus group participants believed as the interviewees that the dates on products come with a margin. However, unlike the interviewees, they believed this was done deliberately on the basis of tests to protect consumers and producers alike. The 'common sense' belief that there is a margin of error built into the expiry dates on products seems to be fairly widespread and accepted among consumers. However, this belief did not seem to undermine the participants trust in the date labels. When asked, participants said they trusted in the date label, but that they simply preferred to also apply their personal judgement when making the final decision.

## 4. Discussion and Conclusion

The aim of the study was to explore how consumers' perceptions of the risks associated with expired date labels in food products depend on the time distance from the expiry date and the product type. Specifically, we wanted to explore the practices consumers have in relation to perceived risks. Several themes emerged from the interviews and were further elaborated in the focus group discussions (Table 3). The major themes were perceiving and handling the risks, self-efficacy on assessing the quality of foods and perception of how date labels are set. However, when discussing the results, it is worth noticing that the participants in both studies were relatively young and this may have influenced the results, especially regarding views on risks associated with expired foods and foodborne illnesses, as they are less prone to serious illness or consequences from these. These views may differ widely from the perspectives of more vulnerable groups, such as the senior citizens, people with chronic diseases or pregnant women, who may be more risk averse (Milne, 2011; Wills et al., 2015).

Table 3: Main themes and findings for the two studies

Themes	Interviews	Focus groups
<b>Risk of illness</b>	Risk was product dependent. Of the products shown chicken was seen as most problematic. Risk of illness was seen as small.	Risk was strongly product dependent: fish and chicken seen as the most problematic products. Risks again seen as surmountable. Once a product is bought, consumers were seen as accountable.
<b>Handling</b>	The correct storage and hygienic handling of products, particularly open products was key to manage risks. Focus on the kitchen.	Focus on kitchen hygiene. Further focus on hygiene of stores and ensuring that the chill chain was not broken.
<b>Social risk</b>	Split opinions: some people felt it was unethical or immoral to serve products past their date, others thought it was fine.	Seen as non-existent, as you would not serve food to others, you would not eat yourself.
<b>Self-efficacy</b>	Key to ensure the food was edible and safe.	Key to ensure the food was edible and safe. Discussed the importance of learning, how and which foods can safely be consumed past their date.
<b>Disgust</b>	Found the thought of eating food past the expiration date disgusting.	Acknowledged that people might feel like this, but primarily seen as wasteful behaviour.
<b>Food waste</b>	Mentioned in passing, especially when participants chose to throw food out.	Discussed in detail, both in relation to shopping for and wasting food.
<b>Beliefs about the date label</b>	Several beliefs emerged: dates on products equalled the date a product spoils; Dates included a margin, either to protect consumers or producers; Shelf-life of products was much longer than stated, to push consumers to waste and buy products more frequently.	Believed that date labels are primarily consumer protections. Believed in the margin, but mainly as a protective measure for consumers.  Trust in date labels was high, but they preferred to rely on their senses above all.

When it came to the risks associated with foods that are close to or have expired date labels, both interviewees and focus group participants were able to name common ailments associated with eating spoiled foods, such as stomach ache and diarrhoea, as well as more serious conditions such as food poisoning. These risks were generally associated with chicken, meat, and fish. Dry products such as pasta or heat-treated products, such as milk and yoghurt were generally understood to be harmless to health, even when spoiled. Risk tended to be associated with specific products and product types, rather than to the date label per se. However, despite being able to identify certain risks, both interviewees and focus group participants viewed them with an almost careless attitude. They did not believe the risk of illness was very great, as long as one used one's senses to judge edibility prior to using a product and common sense when making decisions.

Self-efficacy as trust in own senses to judge the edibility of food products before using or discarding a food product, was a key to both the interviewees and the focus group participants. It was a skill that was described in terms of common sense and naturally available to most people. Participants expressing high levels of self-efficacy tended to use their senses more than the information on the date labels, when deciding whether to discard a product. Similarly, according to Gong et al. (2011) when consumers are confident in their abilities to judge the edibility of a product, they tend to view date labels as guidelines, and primarily use their senses when deciding to use a product. Self-efficacy can also be counter-productive in the case of 'use by' labels, as awareness of the potential risks associated with eating foods after the date label has expired did not result in putting one's own judgements aside. This may be due to the fact, that severe cases of foodborne illnesses are rare in Denmark. However, this may also be due to optimism bias that causes individuals to believe they are less likely to experience a negative outcome of a behaviour, i.e. contracting a foodborne illness (Sharot, 2011). This could potentially be problematic, given that individuals often establish habits around when and what foods are safe to use past their dates (Gong et al., 2011), but as pointed out by the focus group participants, consumers might not attribute illness to having eaten spoiled food, unless they become very ill.

While potential risks were unlikely to prompt individuals to throw out food products, a few of the interview participants revealed that they throw out foods with expired date labels on principle. Not because they believe the food has necessarily spoiled, but because the thought of eating it once it has expired disgusts them. The focus group participants generally viewed throwing away food on principle as wasteful. The issue of waste, specifically food waste, was present during both the interviews and the focus groups. Participants were preoccupied with making sure they themselves were not seen as wasteful in their day-to-day life and often coupled date labels with issues surrounding food waste. This emphasis on food waste and not being seen as wasteful, may have made certain participants exaggerate their willingness to use foods long past their expiration date. This phenomenon is termed social desirability bias and may lead individuals to give answers that do

not violate the social norm and make them to be seen in positive light (King & Bruner, 2000). Social desirability bias may have contributed to disgust being a minor issue in focus group discussions compared to interviews as focus groups are social interactions. However, the emphasis on food waste shows that consumers seek to balance food safety and food waste at home, and may seek to minimise any guilt associated with wasting food, by relying primarily on their senses when judging edibility of expired foods.

Consumers further used various common-sense beliefs regarding the date labels to justify, why they use foods past their *use by* date. Both Interviewees and focus group participants expressed the belief that the dates were intentionally set earlier than they needed to be, although different reasons for this emerged. Some believed it was either to protect consumers from foodborne illnesses or protect producers from potential lawsuits and bad press. While a few participants felt producers intentionally shortened the shelf life of products to force consumers to buy their product more often than necessary. However, despite carrying these beliefs, focus group participants did pointed out that they did trust the information conveyed by the date label, but they preferred to use their senses when deciding to throw out an expired product.

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## 6. Appendix

**Appendix 1:** Interview guide - Danish

**Appendix 2:** Pictures used in Interviews

**Appendix 3:** Consent form interview - Danish

**Appendix 4:** Focus group guide - Danish

**Appendix 5:** Food used during focus groups

**Appendix 6:** EU Date label Use

**Appendix 7:** Pictures of actors used during focus groups

**Appendix 8:** Consent form focus groups - Danish

## Appendix 1: Interview guide

# Datomærker 21: Interview guide

### Formål med interviewene:

Formålet med interviewet er at få en dybere forståelse for, hvordan forbrugerne forholder sig til risikoen ved åbnede og uåbnede produkter der er enten er gået over dato eller har været åbne i længere tid.

### Produkterne (foreslået):

Sidste anvendelse: Røget laks, kylling

Bedst før: Hakkekød, yoghurt

### Tid:

#### Uåbnede produkter:

- SA: start 3 dage inden datoen, på dato, 2 dage over datoen, 5 dage over datoen
- BF: start 3 dage inden datoen, på datoen, 7 dage over, 1 måned over datoen

#### Åbnede produkter:

- Den er ikke over dato, men har været åben 2 dage, 5 dage åben, 8 dage åben

### Scenarier:

*Du er i gang med at lave mad/dække bord og du tager XXX ud af køleskabet/køkkenskabet, pakken er ikke åben, men det er gået Y dage over dato.*

*Du er i gang med at lave mad/dække bord og du tager XXX ud af køleskabet/køkkenskabet, du opdager at pakken er åbnet. Du kommer i tanker om at du åbnede den i lørdags, og i dag er det **mandag/fredag/søndag ugen efter**, så pakken har været åben i Y dage. Produktet kan stadig holde sig en uge mere ifølge datomærket.*

Alle scenarier følges af billeder af produkterne som der bliver talt om.

**Antal interviewpersoner:** 10-15

**Længde:** 20-30 minutter

Scenarie	Spørgsmål	Formål
Introduktion		
<i>Vi skal snakke lidt om datomærker i dag, og vi begynder med nogle spørgsmål omkring din husholdning og datomærkerne</i>	<b>Hvem står for madlavningen/indkøb hjemme hos dig?</b> Hjælper du til/hvor meget står du for?	
	Det er ikke et rigtig eller forkert spørgsmål, jeg vil bare gerne vide hvilken viden du har. <b>Kan du fortælle mig hvilke datomærker der findes i Danmark, og hvad de betyder?</b>  Hvad tror du datomærket prøver at fortælle dig?  Er der forskellige datomærker?	Få en forståelse af hvilken viden de har

Scenarier (4)		
<p><i>I næste del vil vi gennemgå en X senarier med dig. Scenarierne omhandler forskellige produkter. Til hvert scenarie følger en række spørgsmål, der vil blive gentaget.</i></p>		
<p><b>Forestil dig at du står derhjemme. Du er i gang med at dække bord til morgenmaden og du tager en yoghurt ud af køleskabet, den er ikke åben, men det er gået 10 dage over dato.</b></p> <p><i>Billede af produkt med datomærke.</i></p>	<p><b>Hvad gør du nu?</b> Smider du <i>produktet</i> ud? Åbner du det?</p>	
	<p><b>Kan du fortælle mig hvorfor du vælger at gøre dette?</b> <i>Smider ud:</i> hvorfor vælger du ikke at bruge det?</p> <p><i>Undersøger produktet:</i> Hvad vil få dig til at bruge det/ ikke at bruge det?</p> <p><i>Bruger det:</i> Hvorfor vælger du bare at bruge det? Er der noget der kunne få dig til ikke at gøre det?</p>	<p>Forstå med så mange detaljer som muligt, og give os muligheden for at følge temaer omkring self efficacy</p>
	<p><b>Tror du der er nogen risiko forbundet med produktet som det er nu?</b></p> <p><i>Ja:</i> Hvilke? Fortæl mig mere om dem <i>Nej:</i> Så du har det fint med at bruge produktet?</p> <p><b>Hvornår vil du begynde at tænke over om produktet er spiseligt eller ej?</b></p> <p>Spørg ind til andre tidspunkter, er det på dagen? når den går over dato? <i>Hvorfor begynder du at tænke på det på dette tidspunkt?</i></p> <p><b>Hvad vis det er åbent, hvornår ville du så begynde at tænke på spiseligheden?</b></p> <p>Tjekker du datoen, hvis produktet har været åbent en dag eller to? Er det når det går over dato? Hvor mange dage over dato? <i>Hvorfor begynder du at tænke over det på dette tidspunkt?</i> <i>Har det noget at gøre med det der står på produkterne?</i></p>	<p>Risiko</p>

NOTER

<i>Tak, så tager vi det næste scenarie</i>		
<p>Du er i gang med at lave aftensmad, og du tager en pakke kylling ud af køleskabet, du opdager at pakken er åbnet. Du kommer i tanker om at du åbnede den i lørdags, og i dag er det fredag ugen efter, så pakken har været åben i 4 dage.</p> <p>Produktet kan stadig holde sig en uge mere ifølge datomærket.</p> <p><i>Billede af produkt med datomærke.</i></p>	<p><b>Hvad gør du nu?</b> Smider du <i>produktet</i> ud? Åbner du det?</p> <p><b>Kan du fortælle mig hvorfor du vælger at gøre dette?</b> <i>Smider ud:</i> hvorfor vælger du ikke at bruge det?</p> <p><i>Undersøger produktet:</i> Hvad vil få dig til at bruge det/ ikke at bruge det?</p> <p><i>Bruger det:</i> Hvorfor vælger du bare at bruge det? Er der noget der kunne få dig til ikke at gøre det?</p>	<p>Forstå med så mange detaljer som muligt, og give os muligheden for at følge temaer omkring risiko etc. naturligt</p>
	<p><b>Tror du der er nogen risiko forbundet med produktet som det er nu?</b> <i>Ja:</i> Hvilke? Fortæl mig mere om dem <i>Nej:</i> Så du har det fint med at bruge produktet?</p> <p><b>Hvornår vil du begynde at tænke over om produktet er spiseligt eller ej?</b> Spørg ind til andre tidspunkter, er det på dagen? når den går over dato? <i>Hvorfor begynder du at tænke på det på dette tidspunkt?</i></p> <p><b>Hvad vis det ikke var åbent, hvornår ville du så begynde at tænke på spiseligheden?</b> 2 dage? 5 dage? 8 dage? <i>Hvorfor begynder du at tænke over det på dette tidspunkt?</i> <i>Har det noget at gøre med det der står på produkterne?</i></p>	<p>Risiko</p>

## NOTER

<i>Tak, så tager vi det næste scenarie</i>		
<p><b>Forestil dig at du står derhjemme. Du er i gang med at dække på bordet til middagsmad og du tager en pakke røget laks ud af køleskabet, du opdager at pakken er åben. Du kommer i tanker om at du åbne den i lørdags, og i dag er det mandag ugen efter, så pakken har været åben i 2 dage.</b></p> <p><b>Produktet kan stadig holde sig en uge mere ifølge datomærket.</b></p> <p><i>Billede af produkt med datomærke.</i></p>	<p><b>Hvad gør du nu?</b> Smider du <i>produktet</i> ud? Åbner du det?</p>	
	<p><b>Kan du fortælle mig hvorfor du vælger at gøre dette?</b>  <i>Smider ud:</i> hvorfor vælger du ikke at bruge det?</p> <p><i>Undersøger produktet:</i> Hvad vil få dig til at bruge det/ ikke at bruge det?</p> <p><i>Bruger det:</i> Hvorfor vælger du bare at bruge det? Er der noget der kunne få dig til ikke at gøre det?</p>	<p>Forstå med så mange detaljer som muligt, og give os muligheden for at følge temaer omkring risiko etc. naturligt</p>
	<p><b>Tror du der er nogen risiko forbundet med produktet som det er nu?</b>  <i>Ja:</i> Hvilke? Fortæl mig mere om dem  <i>Nej:</i> Så du har det fint med at bruge produktet?</p> <p><b>Hvornår vil du begynde at tænke over om produktet er spiseligt eller ej?</b>            Spørg ind til andre tidspunkter, er det på dagen? når den går over dato?  <i>Hvorfor begynder du at tænke på det på dette tidspunkt?</i></p> <p><b>Hvad vis det ikke var åbent, hvornår ville du så begynde at tænke på spiseligheden?</b>            2 dage? 5 dage? 8 dage?  <i>Hvorfor begynder du at tænke over det på dette tidspunkt?</i>  <i>Har det noget at gøre med det der står på produkterne?</i></p>	<p>Risiko</p>

**NOTER**

Scenarier (4)		
<i>I næste del vil vi gennemgå en X senarier med dig. Scenarierne omhandler forskellige produkter. Til hvert scenarie følger en række spørgsmål, der vil blive gentaget.</i>		
<b>Forestil dig at du står derhjemme. Du er i gang med at lave aftensmad og du tager en pakke hakket kød ud af køleskabet, den er ikke åben, men datoen udløber i dag.</b>  <i>Billede af produkt med datomærke.</i>	<b>Hvad gør du nu?</b> Smider du <i>produktet</i> ud? Åbner du det?	
	<b>Kan du fortælle mig hvorfor du vælger at gøre dette?</b> <i>Smider ud:</i> hvorfor vælger du ikke at bruge det?  <i>Undersøger produktet:</i> Hvad vil få dig til at bruge det/ ikke at bruge det?  <i>Bruger det:</i> Hvorfor vælger du bare at bruge det? Er der noget der kunne få dig til ikke at gøre det?	Forstå med så mange detaljer som muligt, og give os muligheden for at følge temaer omkring self efficacy
	<b>Tror du der er nogen risiko forbundet med produktet som det er nu?</b>  <i>Ja:</i> Hvilke? Fortæl mig mere om dem <i>Nej:</i> Så du har det fint med at bruge produktet?  <b>Hvornår vil du begynde at tænke over om produktet er spiseligt eller ej?</b>  Spørg ind til andre tidspunkter, er det på dagen? når den går over dato? <i>Hvorfor begynder du at tænke på det på dette tidspunkt?</i>  <b>Hvad hvis det er åbent, hvornår ville du så begynde at tænke på spiseligheden?</b>  Tjekker du datoen, hvis produktet har været åbent en dag eller to? Er det når det går over dato? Hvor mange dage over dato? <i>Hvorfor begynder du at tænke over det på dette tidspunkt?</i> <i>Har det noget at gøre med det der står på produkterne?</i>	Risiko



<i>Tak, så tager vi det næste scenarie</i>		
<p><b>Forestil dig at du står derhjemme. Du er i gang med at lave aftensmad og du tager en pakke kyllingebryster ud af køleskabet. Pakken er ikke åben, og der er 3 dage tilbage før SA.</b></p> <p><i>Billede af produkt med datomærke.</i></p>	<p><b>Hvad gør du nu?</b> Smider du <i>produktet</i> ud? Åbner du det?</p> <p><b>Kan du fortælle mig hvorfor du vælger at gøre dette?</b>  <i>Smider ud:</i> hvorfor vælger du ikke at bruge det?  <i>Undersøger produktet:</i> Hvad vil få dig til at bruge det/ ikke at bruge det?  <i>Bruger det:</i> Hvorfor vælger du bare at bruge det? Er der noget der kunne få dig til ikke at gøre det?</p> <p><b>Tror du der er nogen risiko forbundet med produktet som det er nu?</b>  <i>Ja:</i> Hvilke? Fortæl mig mere om dem  <i>Nej:</i> Så du har det fint med at bruge produktet?</p> <p><b>Hvornår vil du begynde at tænke over om produktet er spiseligt eller ej?</b>          Spørg ind til andre tidspunkter, er det på dagen? når den går over dato?  <i>Hvorfor begynder du at tænke på det på dette tidspunkt?</i></p> <p><b>Hvad vis det er åbent, hvornår ville du så begynde at tænke på spiseligheden?</b>          Tjekker du datoen, hvis produktet har været åbent en dag eller to?          Er det når det går over dato? Hvor mange dage over dato?  <i>Hvorfor begynder du at tænke over det på dette tidspunkt?</i>  <i>Har det noget at gøre med det der står på produkterne?</i></p>	<p>Forstå med så mange detaljer som muligt, og give os muligheden for at følge temaer omkring risiko etc. naturligt</p> <p>Risiko</p>
<p>Som det sidste vil jeg gerne spørge dig om hvor sikker du føler dig når du skal beslutte dig for om du vil bruge et produkt eller ej, for de tre produkter vi har snakket omkring i dag. (yoghurt, kylling, hakket kød og røget laks)</p> <p><i>Hvorfor føler du dig sikker/ikke sikker på denne fødevarer? Hvad med de andre fødevarer?</i></p>		

<b>Afslutning</b>		
<i>Så er vi færdige med scenarierne, og jeg har ikke flere spørgsmål. Har du noget at tilføje eller har du nogen spørgsmål?</i>		

## Appendix 2: Pictures used in Interviews



Figure a2.1: Picture used during the section on use of yoghurt.



Figure a2.2: Picture used during the section on use of chicken



Figure a2.3: Picture used during the section on smoked salmon

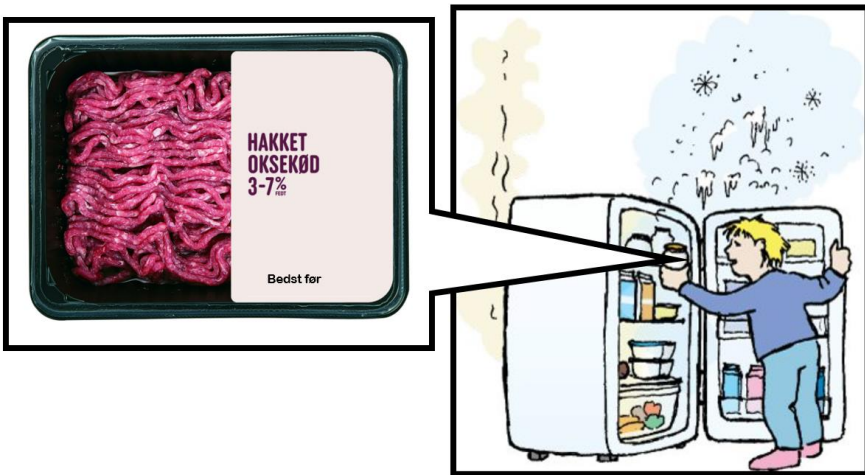


Figure a2.4: Picture used during the section on minced meat

## Appendix 3: Consent form interview



SCHOOL OF BUSINESS AND SOCIAL SCIENCES  
AARHUS UNIVERSITY

### SAMTYKKEERKLÆRING

#### 1. Forbrugerundersøgelse om Datomærker

Du er blevet inviteret til at deltage i forskningsundersøgelsen om forbrugernes holdninger til datomærkede fødevarer der er tæt på eller gået over deres dato. Vi vil gerne bede dig om dit samtykke til at deltage i undersøgelsen og til at behandle dine data i overensstemmelse med lovgivningen om databeskyttelse. Før du beslutter at deltage i denne undersøgelse, er det vigtigt, at du forstår, hvorfor forskningen udføres, og hvad den vil involvere. Tag dig tid til at læse følgende information omhyggeligt. Spørg forskeren, hvis der er noget, der ikke er klart, eller hvis du har brug for mere information.

Undersøgelsen udføres som bestilling for Fødevareministeriet.

#### 2. Projektbeskrivelse og formål med undersøgelsen

For at mindske madspild, bør forbrugeren ikke smide mad ud, der stadig har en god kvalitet og er sikkert at spise. Datomærkningen 'bedst før' indikerer, hvor længe producenten garanterer, at produktet har en god kvalitet, mens 'sidste anvendelsesdato' indikerer hvor længe produktet er sikkert at spise. Tidligere resultater viser at danske forbrugere ofte undersøger og bruger produkter der er gået over dato.

Undersøgelsen tager udgangspunkt i, hvordan forbrugerne har det med at bruge fødevarer der er tæt på eller over dato.

#### Dataansvarlig, forskningsgruppe og forskningsansvarlig

Forskningsansvarlig: Liisa Lätheenmäki, liisal@mgmt.au.dk

Dataansvarlig: Susanne Hansen, sha@mgmt.au.dk

#### 3. Undersøgelsesprocedure

Undersøgelsen er et online interview der forventes at tage 30-45 minutter

#### 4. Fordele og risiko

Denne undersøgelse medfører ingen risici ud over dem, der opstår i den normale hverdag.

Efter deltagelse i interviewet vil du modtage et gavekort på 300 kr. fra Userneeds.

#### 5. Type af personlig data og hvornår det er slettet/anonymiseret

Denne undersøgelse indsamler normale personlige oplysninger. Specifikt indsamler vi oplysninger i form af kontaktoplysninger og knytter dem til en personlig identifikator. Oplysningerne indsamles kun til undersøgelsesformål. Alle data fra denne undersøgelse holdes fortrolige. Dine svar bliver holdt private, og vi vil ikke medtage oplysninger, der gør det muligt at identificere dig i nogen rapport, vi måtte offentliggøre. Forskningsregistre gemmes sikkert på kodeordbeskyttede computere. Kun forskergruppen har adgang til dine data.

Vi opbevarer dine anonymiserede data indtil 31. december 2022.

#### 6. Potentielle eksterne databehandlere

Vi deler ikke dine anonymiserede data med eksterne databehandlere.

Resultatet af undersøgelsen vil blive udgivet i en rapport, og vil efterfølgende kunne danne grundlag for en videnskabelig artikel.

## 8. Tilbagetrækning af samtykke

Deltagelse er frivillig, og du kan til enhver tid under interviewet trække dit samtykke tilbage uden at angive en grund. Dette gøres ved at kontakte Susanne Hansen, sha@mgmt.au.dk. Deltagelsen kan ikke trækkes derefter, fordi personen ikke kan identificeres i dataene.

Ved at underskrive bekræfter jeg at have modtaget, læst og forstået ovenstående oplysninger, og at:

A. Min deltagelse er frivillig, og jeg kan trække mit samtykke tilbage og ophøre med at deltage i projektet når som helst som angivet i punkt 8. Min afvisning af deltagelse vil ikke resultere i nogen straf.

B. Ved at underskrive denne aftale fratager jeg ikke nogen juridiske rettigheder eller frigiver Aarhus Universitet, dets aktører eller dig fra ansvar for uagtsomhed.

C. Jeg giver mit samtykke til at behandle mine personlige data og at deltage som et emne i undersøgelsen som beskrevet ovenfor.

D. Jeg indvilliger i at blive videooptaget i forbindelse med interviewet, så resultaterne kan transskriberes og analyseres.

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(Underskrift og dato)

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(Navn på deltager, Udfyld venligst i blokbogstaver)

## Fokusgruppe Interview: Datomærker 21

Tre grupper af 5 personer (15 deltagere i alt), fokusgrupperne vil være halvanden time

### Formålet

Få mere viden omkring hvordan forbrugerne forholder sig til fødevare der er tæt på eller over dato. Fokusgruppeguiden er udarbejdet med af en analyse af interviewene kørt i foråret 2021.

### Hvad skal bruges:

- Alle udsagn brugt i interviewene skal printes på papir, der kan ligge fremme under interviewet
- Der skal ligge produkter fra forskellige produktkategorier på bordene, så deltagere kan referer til bestemte fødevaregrupper
- Kort med navne på aktører inden for fødevare og datomærker
- Skema over beslutningen med om noget skal datomærkes med det ene eller det andet

Tema	Spørgsmål	Formål	Tid
Intro	Fokusgruppe om fødevare der er tæt på eller over deres dato. Samtykke og optagelse af grupperne Gennemgang af hvad de kan forvente Spilleregler for deltagelse: forventer at alle deltager aktivt i diskussionerne, hvis ikke der er nogen der siger noget, kan jeg finde på at pege på folk, hvis i har noget at sige, må i godt stikke en hånd i vejret, så vi ikke afbryder for meget. Alle svar og meninger er vigtige!	Afklaret forventninger, spilleregler, og samtykke	5 min
Icebreaker		Introducerer alle for alle, gør dem trygge ved at snakke	10 min



Fødevarerisiko		
<i>Intro</i>	<p>Jeg hare en række udsagn omkring hvilke risiko der kan være forbundet med at spise fødevarer der er gået over deres dato, hvert udsagn vil blive læst op, og så vil jeg gerne have jer til at diskutere mellem jer,</p> <ul style="list-style-type: none"> <li>- om i er enige, hvad der bliver sagt,</li> <li>- om der er grænser for om det gælder osv.</li> <li>- I må gerne diskutere det for de produkter som i kan se her på bordet.</li> </ul>	
<i>Sygdom</i>	<p><b>U<sub>1</sub>:</b> Jeg tror ikke at det er sådan direkte sundhedsskadeligt at spise produkter der er gået over dato, det sker der normalt ikke det store ved.</p> <p><b>U<sub>2</sub>:</b> I og med at det er madvare, jamen hvis du så spiser noget der har ligget for længe og er blevet dårligt, jamen så får du jo ondt i maven, og så skal det jo ud igen den anden vej. Det er jo det der kan ske.</p>	Afklare forskellige aspekter af risiko, her skal deltagere (hvis de ikke selv gør det) opfordres til at snakke om forskellige produktkategorier i forhold til hinanden.
<i>Kvalitet</i>	<p><b>U<sub>1</sub>:</b> Jeg går ikke så højt op i kvaliteten af det jeg spiser, for jeg har før spist ting som var rimelig gamle, altså hvor jeg er endt med at kigge på pakningen og set det er rimelig gammelt, men det var i gryden, så prøver man det jo bare.</p> <p><b>U<sub>2</sub>:</b> Når jeg opdager et produkt der er over dato, så ville jeg have den der tanke om, at nu er det blevet dårligt, og så vil jeg blive i tvivl om det smagte dårligt. Så er det nemmere bare ikke at spise det.</p>	Afklare hvordan deltagerne har det med tanken om at spise produkter over dato generelt, og i forhold til forskellige produktkategorier.
<i>Disgust</i>	<p><b>U<sub>1</sub>:</b> Når et produkt er gået over dato, så betyder det at maden er for gammel, og så kan jeg ikke få mig selv til at spise maden længere, bare tanken om det, ad!</p> <p><b>U<sub>2</sub>:</b> Jeg smager og prøver altid forskellige fødevarer, lige meget hvad datomærket siger, og selv når det begynder at se lidt uappetitligt ud, eksempelvis brune pletter på æblerne</p>	
<i>Håndtering</i>	<p><b>U<sub>1</sub>:</b> Altså, så længe at produktet var blevet håndteret forsvarligt, så ville jeg godt bruge det, selvom det er gået over dato, men hvis den eksempelvis havde været ude på bordet for længe, så ville jeg ikke bruge den.</p> <p><b>U<sub>2</sub>:</b> En anden ting er, hvordan du tilbereder det, for så længe du varmer noget op, så dræber du også en del af det skadelige, når produktet er gået ud over sin dato.</p>	Afklare hvilken indflydelse håndteringen af fødevarer har på deltageres forståelse for risiko

40 Min

## Fødevarerisiko

### *Social Risiko*

**U<sub>1</sub>:** Hvis jeg havde inviteret gæster, så ville jeg aldrig nogensinde putte et produkt der er gået over dato på bordet, det er sku' på en måde lidt uetisk. Jeg har ikke noget imod at udsætte min egen familie for det, men man kan ikke inviterer gæster og så serverer mad som er gået over dato.

**U<sub>2</sub>:** Jeg har det sådan, at hvis jeg selv kan spise det, så kan mine gæster også, så er det da lige meget om produktet er gået over dato.

Her vil de mere sociale aspekter af risiko blive afdækket.

Self Efficacy			
<i>Intro</i>	<p>Jeg hare en række udsagn omkring hvor gode folk er til at se om produkter der er gået over dato kan bruges, hvert udsagn vil blive læst op, og så vil jeg gerne have jer til at diskuterer mellem jer,</p> <ul style="list-style-type: none"> <li>- om i er enige, hvad der bliver sagt,</li> <li>- om der er grænser for om det gælder osv.</li> <li>- I må gerne diskuterer det for de produkter som i kan se her på bordet.</li> </ul>		
<i>Bestemme om noget er sikkert</i>	<p><b>U<sub>1</sub>:</b> Problemet med produkter der er gået over dato er, at du kan ikke nødvendigvis lugte de bakterier der er i maden, og du kan ikke nødvendigvis lugte de giftstoffer, som eventuelt vil være der, så der kan du risikerer at du får det rigtig træls.</p> <p><b>U<sub>2</sub>:</b> Generelt, hvis et produkt er gået over dato, så ville jeg lige tjekke. Lugter det? Nej. Ser det dårligt ud? Næh. Kan jeg bruge det? Ja. Du kan næsten altid se om det kan bruges ved at se på det, og lugte til det.</p>	Hvordan forholder deltagerne sig til om ma "bare" kan se på et produkt og se om det er ok.	10 min
<i>Time</i>	<p><b>U<sub>1</sub>:</b> Jeg synes selv at man godt kan blive i tvivl når det er gået 2-3 dage over dato, er det nu stadig godt? Er det ikke lidt lang tid at det har ligget.</p> <p><b>U<sub>2</sub>:</b> Efter en uge vil jeg nok blive lidt betænkelig på om det ikke er gået lidt for mange dage over dato, altså om det ikke er begyndt at gå i, ja forrådnelse er nok lidt kraftigt et ord at bruge, men om det ikke er begyndt at gå i forrådnelse.</p>		

Viden om datomærker			
<i>Intro</i>	<i>Nu har vi snakket en del om forskellige aspekter ved datomærker og fødevarer der er over dato. Her som det sidste vil jeg lige høre lidt om jeres viden omkring datomærker.</i>		10 min
	Hvilke datomærker findes der i Danmark?		
	Hvad tror i de betyder?		
	Er det noget i lægger mærke til og bruger i jeres hverdag?		

Forestillinger om datomærker		
<b>Intro</b>	<i>Nu har vi snakket om forskellige aspekter ved det at spise fødevarer der er over dato, men u vil jeg gerne fokusere lidt mere på hvem i tror står bag datomærker på fødevarer og hvilke interesser de kan have i at fastsætte datoer.</i>	Afdække hvilke forestillinger deltagerne har i forhold til hvorfor datomærkerne er der, hvem der styrer det, og hvem det tilgodeser.
<b>REGULATION</b>	<i>I Danmark bestemmer FVST hvilke datomærker der må bruges (BF/SA), mens producenterne kan vælge hvilke datomærker og datoer de sætter på deres vares. (skema)  Jeg har her nogle kort med navnene på nogen forskellige aktører når det kommer til datomærker og datomærkede fødevarer, og vi skal se lidt nærmere på dem.</i>	
<b>Aktors &amp; questions</b>	<p><b>Aktører: FVST, Producenterne, Butikkerne, Forbrugeren</b></p> <ul style="list-style-type: none"> <li>- Hvem eller hvad tilgodeser datomærkerne? / Hvilken indflydelse har _____ på datomærkerne? <ul style="list-style-type: none"> <li>o Hvorfor bliver de sat som de gør? <ul style="list-style-type: none"> <li>▪ Test af holdbarhed</li> <li>▪ Få os til at købe mere</li> <li>▪ Kun med pga. lov</li> <li>▪ Beskytte bestemte aktører (hvem? Mod hvad?)</li> </ul> </li> </ul> </li> <li>- Hvordan påvirker _____ de andre aktører i kan se?</li> </ul>	
		20 min

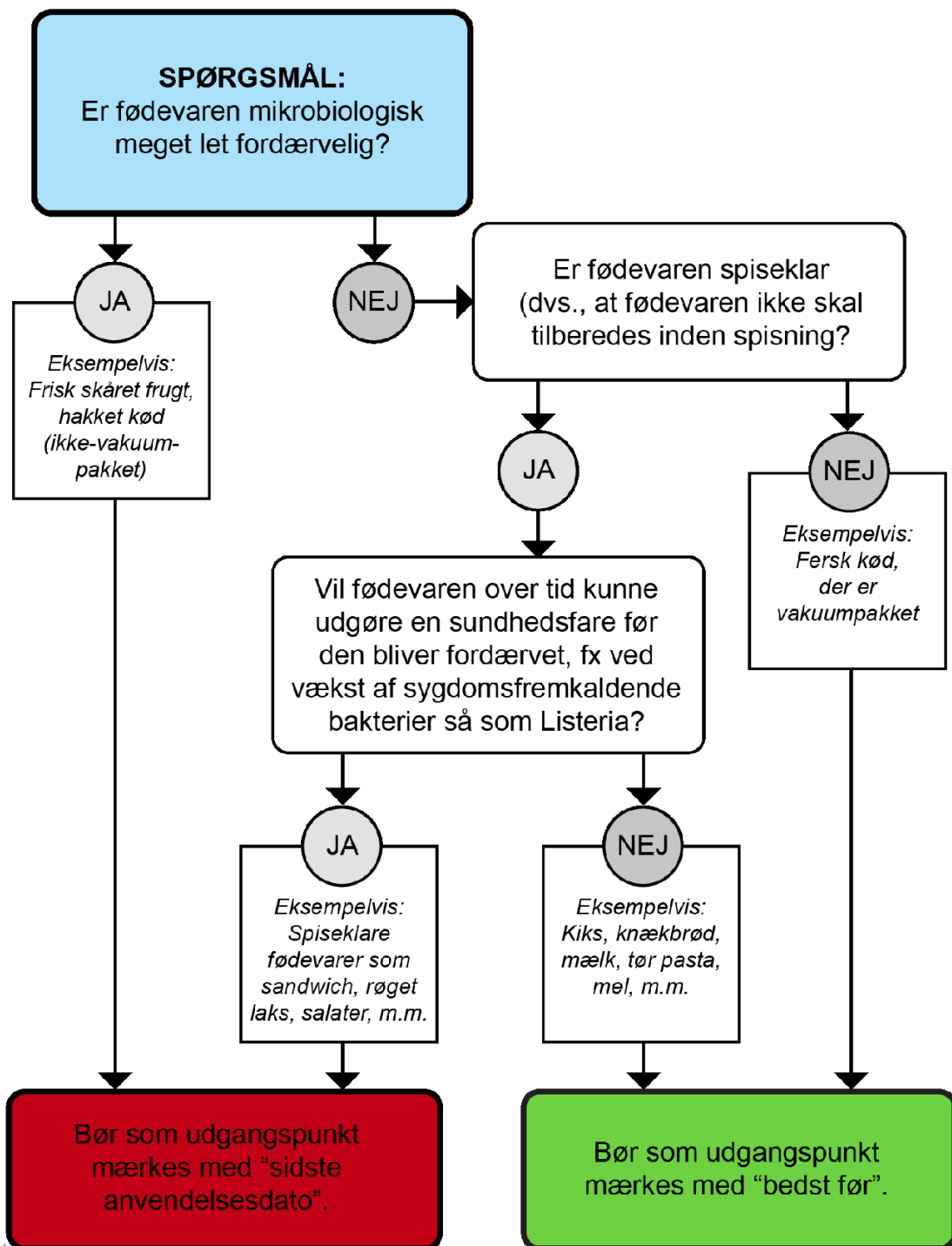
	- Stoler i på at de datomærker som de sætter?		
<b>Generelt</b>	Er der nogen aktører som er blevet overset? <i>(gentag spørgsmål for andre aktører som deltagerne nævner)</i>	Noterer svarene så diskussionen, så disse perspektiver kan afdækkes	

<b>Afslutning</b>			
	<i>Jeg har ikke flere spørgsmål nu, men jeg vil lige hører om i har nogle spørgsmål til mig, nogle kommentar til det vi har snakket om, eller noget i gerne vil uddybe eller have uddybet.</i>		5 min

Appendix 5: Food used during focus groups

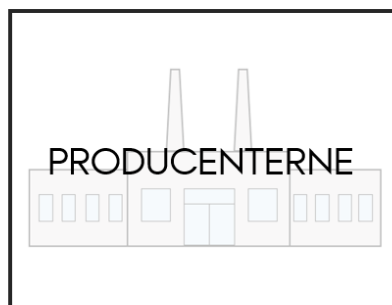
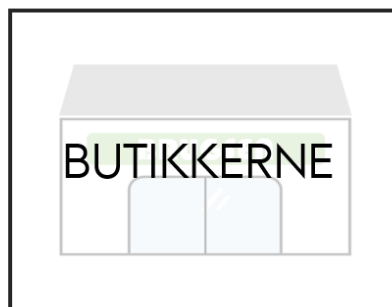


## Beslutningstræ for holdbarhedsmærkning





Appendix 7: Pictures of actors used in the interviews



## Appendix 8: Consent form focus groups



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### SAMTYKKEERKLÆRING

#### 7. Forbrugerundersøgelse om datomærkede fødevarer

Du er blevet inviteret til at deltage i forskningsundersøgelsen om datomærkede fødevarer der er tæt på eller gået over dato.

Undersøgelsen udføres som bestilling for Fødevarerministeriet.

#### 8. Projektbeskrivelse og formål med undersøgelsen

Med baggrund i en tidligere rapport om datomærker ønsker vi at afdække danske forbrugeres holdninger til brugen af fødevarer der er gået over dato. Herunder ønsker vi at afklare, hvordan deltagerne i undersøgelsen har det med at bruge disse fødevarer.

#### 9. Dataansvarlig, forskningsgruppe og forskningsansvarlig

Forskningsansvarlig: Susanne Hansen sha@mgmt.au.dk

#### 10. Corona

Der er fokus på at begrænse smitterisikoen blandt deltagerne i fokusgruppen. Samtlige flader vil blive sprittet af både før og efter hver workshop. Deltagerne vil sidde forskudt ved bordene med min 1 meters afstand. Der vil være håndsprit tilgængeligt.

#### 11. Fordele og risiko

Denne undersøgelse medfører ingen risici ud over dem, der opstår i den normale hverdag.

Efter deltagelse i fokusgruppen, vil du modtage et gavekort på 500 kr. Den online workshop forventes at varer halvanden time.

#### 12. Type af personlig data og hvornår det er slettet/anonymiseret

Denne undersøgelse indsamler normale personlige oplysninger. Specifikt indsamler vi oplysninger i form af kontaktoplysninger og knytter dem til en personlig identifikation, såsom ID nummer. Oplysningerne indsamles kun til undersøgelsesformål. Alle data fra denne undersøgelse holdes fortrolige. Dine svar bliver holdt private, og vi vil ikke medtage oplysninger, der gør det muligt at identificere dig i nogen rapport, vi måtte offentliggøre. Forskningsregistre gemmes sikkert på kodeord beskyttede computere. Kun forskergruppen har adgang til dine data.

Vi opbevarer dine anonymiserede data indtil 31. december 2021.

#### 13. Potentielle eksterne databehandlere

Vi deler ikke dine data med eksterne databehandlere.

Resultatet af undersøgelsen vil blive udgivet i en rapport, og vil efterfølgende kunne danne grundlag for en videnskabelig artikel.

#### 8. Tilbagetrækning af samtykke

Deltagelse er frivillig, og du kan til enhver tid under workshoppen trække dit samtykke tilbage uden at angive en grund. Dette gøres ved at kontakte Susanne Hansen, sha@mgmt.au.dk. Deltagelsen kan ikke trækkes derefter, fordi personen ikke kan identificeres i dataene.

Ved at underskive bekræfter jeg at have modtaget, læst og forstået ovenstående oplysninger, og at:

A. Min deltagelse er frivillig, og jeg kan trække mit samtykke tilbage og ophøre med at deltage i projektet når som helst som angivet i punkt 8. Min afvisning af deltagelse vil ikke resultere i nogen straf.

B. Ved at underskrive denne aftale fratager jeg ikke nogen juridiske rettigheder eller frigiver Aarhus Universitet, dets aktører eller dig fra ansvar for uagtsomhed.

C. Jeg giver mit samtykke til at behandle mine personlige data og at deltage som et emne i undersøgelsen som beskrevet ovenfor.

D. Jeg indvilliger i at blive videooptaget i forbindelse med fokusgruppen, så resultaterne kan transskriberes og analyseres.

E. Jeg giver forskerne lov til at indsamle og gøre brug af alt materiale der produceres under fokusgruppen.

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(Underskrift og dato)

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(Navn på deltager, Udfyld venligst i blokbogstaver)