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## Reviving Food Resources: Enabling Upcycled Food Production in Sweden

Kamran Rousta, Högskolan i Borås

Maria Nehme O'Neill, Petter Melin, Mats Stading & Karin Östergren, RISE  
Research Institutes of Sweden

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# Abstract

Upcycled foods, products made from edible food residues that would otherwise have been discarded, offer an approach to tackling food waste, climate impact, and resource inefficiency. These foods provide both environmental and economic value by converting surplus into new, nutritious products. The project 'Reviving Food Resources', carried out in collaboration between RISE, the University of Borås, and Axfood, aimed to explore how upcycled foods can be more effectively integrated into the Swedish food supply chain. Through a stakeholder-driven approach and systematic needs assessment, the project identified barriers, opportunities, and actionable insights for implementation.

The project shows that there is technical potential and motivation to develop upcycled foods, but also a need for systematic support to address practical, commercial and structural barriers. In addition to technical feasibility, business and collaboration models need to be adapted to local conditions and the characteristics of the raw materials.

The project resulted in

- A framework/working method for identifying barriers and challenges.
- An initial analysis of Swedish food companies' views on upcycling
- Recommendations for further work

Key words: Upcycled food, Circular food systems, Food loss and waste

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# Preface

The project 'Reviving Food Resources', was carried out in collaboration between RISE, the University of Borås, and Axfood, aimed to explore how upcycled foods can be more effectively integrated into the Swedish food supply chain.

The project team consisted of Helena Allard, Axfood; Petter Melin, RISE; Maria Nehme O'Neill, RISE; Kamran Rousta, Högskolan i Borås; Mats Stading, RISE & Karin Östergren, RISE (Project leader). For further information on the project, please contact Karin Östergren.

A special thank you to Marcus Adevi Klasson RISE supporting in setting up the survey, to Karin Lindow, Swedish board of Agricultures, supporting with valuable insights when developing the survey, Julia Berglund, Business developer of Swedish food bank network providing insights regarding donations of food in Sweden and Hanieh Moshtaghian, RISE who wrote the proposal. Finally, a big thank you to the stakeholders engaging through the survey and workshop.

The project was carried out between October 2024 – May 2025 within the program Net Zero Industry, being one of five innovation programs within Impact Innovation.

We gratefully acknowledge the financial support from Vinnova Sweden's innovation agency (Grant number 2024-03012,) which made this project possible.

# 1 Background and Aim

Food loss and waste represent a major global challenge, contributing to food insecurity, economic loss, and environmental degradation. Globally, around 1.6 billion tonnes of food are wasted annually, of which 1.3 billion tonnes are considered edible [1]. Waste is generated at every stage of the food supply chain, from production and storage to processing, distribution, retail, and consumption [2]. In Europe, approximately 40% of food waste occurs during production, handling, and processing, while 60% originates at the retail and consumer levels [3].

Much of this discarded food remains edible and could be reintroduced into the food system as ingredients or finished products. These nutrient-rich residues offer an opportunity to transform low-value residues into high-value food, aligning with the principles of the circular economy and contributing to sustainability and profitability goals [4]. Reusing edible residues in new food production is therefore a promising strategy for resource efficiency and value creation.

Such products are commonly referred to as upcycled foods (UFs), a term coined by the Upcycled Food Association. UFs are foods made from ingredients that would otherwise not be directed to human consumption, processed through verified supply chains, and positively impact the environment [5]. Typical sources include surplus, damaged produce, and safe by-products from food processing. Upcycled food production not only reduces waste but also enhances the overall value and sustainability of the food system.

Despite growing interest, UF integration remains limited in Europe, including Sweden. While the United States has introduced certification schemes and consumer awareness initiatives, similar frameworks are lacking in the EU. Moreover, existing research has primarily focused on consumer acceptance, with limited attention to supply chain stakeholders.

This project aims to address that gap by identifying the needs, barriers, and opportunities for Swedish food sector actors to engage in upcycled food production and develop scalable, context-specific strategies for implementation.

# 2 Project Implementation

The project was carried out in five main phases, beginning with data collection and concluding with public and academic dissemination. The implementation process combined both empirical investigation and participatory methods to ensure relevance for stakeholders and applicability in real-world settings. An overview of the project's structure and workflow is illustrated in Figure 1.

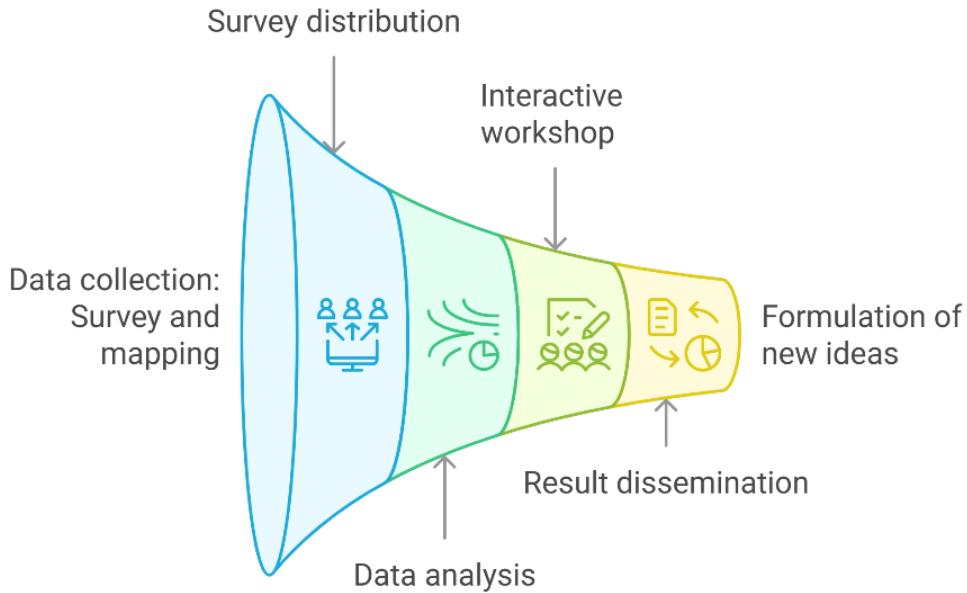


Figure 1. Overview of the project's implementation steps.

## 2.1 Data collection through survey and mapping of existing models

The initial phase of the project focused on designing a survey targeting actors across the food supply chain, including producers, wholesalers, retailers, restaurants, and organizations engaged in food donation and redistribution. The survey was based on current scientific literature on food waste, upcycling, and circular food systems and addressed four key themes including: types and quantities of edible food waste, current practices for food waste management, identified barriers and enablers for transforming food waste into new food products, stakeholders' willingness to manage and upgrade surplus food resources.

The aim was to collect both quantitative and qualitative data on existing practices and perceived conditions for scaling up the reuse of food resources. The findings from the literature review served as the foundation for the survey design, which was initially tested and validated through feedback from experts in the field [6]. In parallel, a mapping of existing models for donation and redistribution was conducted. This included volume estimates, flow mapping where data was available, economic incentive structures, and identification of key actors in different segments of the food system.

## 2.2 Survey distribution to food system stakeholders

The survey was distributed digitally to a broad selection of stakeholders across the food chain. The target group included both small and large operations, private and public entities, and non-profit organizations. Distribution took place through direct contacts, established networks, industry channels, and LinkedIn to ensure a diverse range of perspectives.

## 2.3 Survey analysis and development of solution proposals.

The survey responses were analyzed to identify recurring patterns, differences across stakeholder groups, and perceived needs, barriers, and opportunities related to the reuse of edible waste. Both quantitative and qualitative responses were used, enabling deeper insight into contextual challenges. Based on the analysis, concrete solution proposals were formulated, including technological, logistical, and organizational strategies as well as recommendations for policy development, business models, and collaborative frameworks. Special attention was given to adaptable solutions suitable for diverse side streams and regional contexts.

## 2.4 Interactive workshop: validation, co-creation, and collaboration

Another component of the project was an interactive workshop involving actors from various parts of the food system. The workshop served to present findings from the survey and mapping, and to stimulate joint idea development. Participants worked in groups on a practical task: developing concepts for new food products, specifically pies, based on side streams such as fish, vegetables, seaweed, buttermilk, and dry bread. The activity was supported by creative methods and a digital collaboration platform (Mural), where ideas and discussions were documented. A plenary discussion followed, offering reflection and further development of concepts. The dialogue validated prior insights and generated new perspectives on value creation through product design, communication, and positioning.

## 2.5 Result compilation and scientific dissemination

In the final phase, project results were compiled into a public report aimed at practitioners, policymakers, and other stakeholders. The report includes empirical data, stakeholder perspectives, and actionable recommendations for further development of food resource reuse. In addition, the project's methods and findings were submitted as a conference contribution to a scientific forum on sustainable food systems, aiming to enrich the academic discourse on circular food infrastructures, business models, and policy innovation.

# 3 Results

This section presents the key findings from the literature review, the mapping of food donation practices, and the empirical insights gathered through the stakeholder survey and interactive workshop.

### 3.1 Upcycling: State of play

Food losses in the Swedish primary production have recently been estimated for 8 categories [7] of food and was found to be around 450 000 tonnes/year. The largest amounts of loss were found for wheat, potatoes and carrots, while the highest monetary losses were attributed to beef, fish, and strawberries. A smaller pilot study on food losses in the industrial sector was also conducted. It concluded that while most companies reported only a few percent of losses, certain sectors experienced losses as high as 20–50% [8]. The amounts of food waste in industry and food stores are reported to be 305 000 ton/year respectively 87 000 tonnes/year including inedible parts of food [9].

Generally, the upcycling of food can roughly be categorized in two groups:

- (I) Side streams that can be (relatively) easily handled and upgraded to new food products, e.g. bread, fruit and vegetables damaged in transport, not sold in time and fully edible side streams rejected mainly for economic or cultural reasons
- (II) Side streams that require greater effort to manage (e.g. large investments), but can provide niche products with high economic margins

The literature review revealed that most existing research has primarily focused on the characterization of side streams and the development of technical solutions for their valorization or upcycling. The FoodWasteEXplorer [10] is a database on the composition of various side streams from the food industry.

An overview of various industrial valorization routes, including non-food options, is provided in the Annex to the FORKLIFT tool [11]. This includes examples such as apple pomace, brewers' spent grain, blood, whey permeates, tomato and orange pomace, vegetable oil press cake, carcass fats and proteinaceous matter, potato processing by-products. Recently, the Danish Thinktank ONE/THIRD published an inspiration catalogue on upcycling [12], and FoodvalleyNL released a position paper on the subject [13].

The role of consumers in relation to upcycled foods is an emerging area of research [14] focusing both on how consumers perceive upcycling [15] and their acceptance of various upcycled food products [16-18]. While there is growing interest in consumer behavior, research on business models for upcycled foods remains limited. However, a recent study of the Australian dairy value chain has provided valuable insights into the range of barriers that must be addressed when developing upcycled and circular food systems [19]. From a broader perspective, upcycling is increasingly recognized as a key component in the transition toward more circular food systems, though it presents considerable complexity due to variations in raw material streams, processing requirements, regulatory constraints, and market dynamics [20-22].

An overview of recent initiatives focused on upcycling is presented in Table 1.

**Table 1.** Recent initiatives targeting upcycling

<b>Initiative</b>	<b>Description</b>	<b>Link</b>
UPcycled4Food Initiative	Network initiated by Foodvalley (305 partners) in the Netherlands. Currently 12 organisations have joined the upcycling community	<a href="https://foodvalley.nl/en/upcycling-community/">https://foodvalley.nl/en/upcycling-community/</a>
Food Upcycling	Project will run between 2025- 2027 targeting Danish and international companies (Teknologisk Institut, DI Fødevarer, Dagrofa, Landbrug & Fødevarer, DTU Food, Food & Bio Cluster Denmark and FoodvalleyNL)	<a href="https://www.foodupcycling.dk/">https://www.foodupcycling.dk/</a>
Upcycled Food Associations (UFA)	Membership-based trade association that offers Upcycled Food certifications	<a href="https://www.upcycledfood.org/">https://www.upcycledfood.org/</a>

### 3.2 The role of donations

In addition to upcycling, food donation represents an important complementary pathway for managing food surplus. Since both upcycling and donation strategies can and should operate in parallel, it was essential for this project to gain a better understanding of the volumes and types of food currently being donated. Given the lack of a central reporting system for food donations in Sweden, an interview was conducted with Ätbart [23], a key actor within the Swedish food bank network. Ätbart collaborates with other organizations on shared challenges and develops support materials related to food donations. According to their estimates, larger organizations redistribute approximately 6,000 tonnes of food annually, while smaller organizations contribute at least 3,500 tonnes per year.

Larger organizations typically receive food donations from industry and wholesale suppliers, whereas smaller organizations collect surplus directly from retail stores. Commonly donated items include bread (often in surplus), flavored dairy products, fruit, porridge, sauces, cold cuts, uniquely flavored snack products, and soft seasonal drinks. Meat is rarely donated due to regulatory constraints, and products requiring age restrictions such as alcohol-free beer are generally not accepted.

There is a notable surplus of items such as bread and processed foods, whereas basic staples are often in short supply. Certain donated products such as confectionery or unusually flavored dairy items may be less appropriate for addressing food insecurity but can be better utilized in institutional kitchens. Spoiled food is typically discarded, although no systematic data exists on the proportion of donated food that ultimately goes to waste. While donation agreements are in place and collectors generally avoid visibly spoiled items, they may accept packages if much of the contents are still usable (e.g., a net of oranges with one spoiled piece). A major challenge associated with food donation is logistics; in many cases, fuel and transportation costs exceed the value of the food collected. When compared to the estimated volumes of food loss across the food supply

chain, it is evident that the quantity of food currently redistributed through donation in Sweden remains relatively small.

### 3.3 Insights from the survey

The survey developed (Annex 1) was informed by the literature review and aimed to capture quantitative estimates, stakeholder knowledge levels, and perceived challenges related to the potential upcycling of side streams.

Through the survey the project identified a diverse range of edible side streams across the Swedish food supply chain, based on responses from a stakeholder survey ( $n = 12$ ) and insights from an interactive workshop. The survey revealed rest streams such as pea starch (a by-product), vegetable trimmings, juice pulp, animal by-products, whey, buttermilk, and eggshells. Reported volumes varied significantly, from under 12 tonnes to over 12,000 tonnes per year. Many of these flows were considered suitable for food applications due to their nutritional value and edibility, and several were seen as candidates for transformation into products such as microfibrillated cellulose, hybrid proteins, resistant starch, and fermented foods.

Stakeholders responding to the survey also expressed strong interest in the production of upcycled food, citing opportunities in the development of novel products (e.g., snacks, functional ingredients), value-added processing, and new partnerships aligned with principles of the circular economy. However, significant challenges were also highlighted, including fluctuating small volumes, limited technical capacity, regulatory constraints, low profitability, and market uncertainty.

### 3.4 Insights from the workshop

The workshop contributed additional insights into the feasibility and design of upcycled food products. Participants explored the use of raw materials like fish, seaweed, strawberries, vegetable scraps, and stale bread to create conceptual food prototypes, specifically pies. A key insight was that the cost of processing side streams often exceeds that of primary ingredients, making profitability difficult without market repositioning. Participants emphasized the importance of treating upcycled products as premium or niche offerings that appeal to sustainability-minded consumers. Effective communication and product storytelling were considered essential in creating perceived value.

Workshop discussions also addressed potential avenues for implementation, such as localized processing, partnerships with restaurants, and integration into public food service. Retailers were identified as potential sites for in-store transformation of side streams, such as using surplus fruits and vegetables to produce freshly pressed juice. Participants further called for clearer regulations, improved infrastructure (e.g., storage and logistics), and dedicated platforms to facilitate collaboration between raw material owners and food producers.

## 4 Recommendations

The results collectively demonstrate strong technical potential and stakeholder motivation for developing upcycled foods, while also underscoring the need for systemic support to overcome practical and structural barriers.

However, upcycled food production requires more than technical feasibility; it demands integrated business and collaboration models that reflect local conditions, residue characteristics, and stakeholder capacities. To advance the field, the following actions are recommended:

- Further evaluate promising edible residues for upcycling.
- Establish collaboration platforms linking raw material owners with UF producers.
- Explore the development of a national certification system and supportive policies.
- Launch demonstration projects to test viable production and market strategies.

Together, these efforts can pave the way for a sustainable, circular food system in Sweden and beyond.

## 5 References

1. Food Agriculture Organization. (2021). *Food Wastage Footprint: Impacts on Natural Resources: Summary Report* (FAO).
2. Food Agriculture Organization of the United Nations (2013). *Toolkit: Reducing the Food Wastage Footprint* (FAO).
3. Lipinski, B., et al. (2013). *Reducing food loss and waste*. World Resources Institute Working Paper, 1, 1-40.
4. Teigiserova, D.A. et al. (2020). *Towards transparent valorization of food surplus, waste and loss: Clarifying definitions, food waste hierarchy, and role in the circular*.
5. The Upcycled Foods Definition Task Force (2020). *Defining Upcycled Foods*.
6. Karin Lindow (2025). Swedish board of Agricultures, Personal communication.
7. Swedish Board of Agriculture (2024). *Slutrapport om livsmedelsförluster Resultat och åtgärder för att mer ska bli mat. Rapport 2024:1.*  
[https://www2.jordbruksverket.se/download/18.23e68dd418d7c649d1713a30/1707493705544/ra24\\_1.pdf](https://www2.jordbruksverket.se/download/18.23e68dd418d7c649d1713a30/1707493705544/ra24_1.pdf).
8. Swedish Board of Agriculture (2023). *Pilotstudie om matsvinn och restprodukter i livsmedelsindustrin Rapport 2023:13.*  
[https://www2.jordbruksverket.se/download/18.4483ef91188de34cofd874/1709117251236/ra23\\_13.pdf](https://www2.jordbruksverket.se/download/18.4483ef91188de34cofd874/1709117251236/ra23_13.pdf).
9. Hulten J. et al. (2022). *Livsmedelsavfall i Sverige 2022.*  
<https://www.naturvardsverket.se/publikationer/8900/978-91-620-8908-5/>.
10. EURFIR, FoodWasteEXplorer. <https://www.foodwasteexplorer.eu/>.
11. REFRESH (2018). *FORKLIFT - Valorisation spreadsheet tool. FORKLIFT: Assessing climate impacts and costs of using food side streams.* <https://eu-refresh.org/forklift.html>
12. ONE/THIRD (2024). *Upcycling side streams in the Danish food industry - Inspiration Catalogue.* <https://onethird.dk/wp-content/uploads/2024/10/Upcycling-Side-streams-in-the-Danish-Food-Industry-Inspiration-Catalogue.pdf>
13. Foodvalley (n.d.). *Postion Papaer Upcycled Food& Ingredients.*  
<https://foodvalley.nl/en/position-paper/general/>.
14. Aschemann-Witzel, J. and Stangherlin, I.D.C. (2019). *Upcycled by-product use in agri-food systems from a consumer perspective: A review of what we know, and what is missing*, *Technological Forecasting and Social Change*, 168 (2021), Article 120749.
15. Aschemann-Witzel, J. et al. (2023). *Defining upcycled food: The dual role of upcycling in reducing food loss and waste*, *Trends Food Sci Technol*. Vol. 132.  
<https://doi.org/10.1016/j.tifs.2023.01.001>.

16. Aschemann-Witzel, J. and Peschel, A.O. (2019). *How circular will you eat? The sustainability challenge in food and consumer reaction to either waste-to-value or yet underused novel ingredients*, *Food Quality and Preference*, 77 (2019), pp. 15-20. <https://doi.org/10.1016/j.foodqual.2019.04.012>.
17. Moshtaghian, H. et al. (2024). *Upcycled food choice motives and their association with hesitancy towards consumption of this type of food: A Swedish study*, *British Food Journal* 126 (1), 48-63.
18. Nitzko, S. (2023). *Consumer acceptance of the use of plant and animal by-products*, *Food and Humanity* 1 p1238-12-49. <https://doi.org/10.1016/j.foohum.2023.09.019>.
19. Hetherington, J.B. et al. (2024). *Barriers to circular economy adoption are diverse and some are business-model specific: Evidence from the Australian cheese manufacturing sector*, *J. Clean. Prod.* <https://doi.org/10.1016/j.jclepro.2024.143879>.
20. Ellen MacArthur (n.d.). <https://www.ellenmacarthurfoundation.org/food-and-the-circular-economy-deep-dive>.
21. Moshtaghian, H. et al. (2021). *Challenges for Upcycled Foods: Definition, Inclusion in the Food Waste Management Hierarchy and Public Acceptability*. *Foods*, 10, 2874. <https://doi.org/10.3390/foods10112874>.
22. Yujun Wei et al. (2024). *The complexities of decision-making in food waste valorization: A critical review*, *Journal of Environmental Management*. <https://doi.org/10.1016/j.jenvman.2024.120989>.
23. Julia Berglund (2025). Business developer of Swedish food bank network, Ätbart, Personal communication.

# Annex 1

# Enkät om upcycling av sidostömmer till nya livsmedel

Välkommen till projektet "Återuppliva matresurser". Dina svar hjälper oss att kartlägga potentialen för ökad upcycling i Sverige. Tack för din medverkan!

Den svenska livsmedelskedjan genererar över en halv miljon ton livsmedelsavfall årligen. Upcycling kan minska matsvinn, öka resurseffektiviteten och gynna både miljö och ekonomi. Ett exempel på upcycling är att brygga öl av brödreste, använda broccolistammar eller bärpresskaka som ingredienser i nya livsmedel, extrahera värdefulla ämnen från processvattnet i livsmedelsindustrin eller hacka rotfrukter som sorterats bort på grund av storlek eller utseende och sälja dem till storkök. Projektet utforskar och kartlägger hinder och möjligheter för att underlätta introduceringen av fler upcyclade livsmedel på marknaden genom nya affärsmodeller, värdekedjor och samarbeten. Projektet leds av RISE och Högskolan i Borås i samarbete med Axfood, finansierat av *Net Zero Industry* (Impact Innovation).

## Om enkäten

- Tar ca 20 minuter
- Endast anonymiseraresultat kommer att delas med andra/presenteras. Uppgifter som ex; antal anställda och mängder redovisas i intervall.
- Hanteras enbart av RISE och resultaten delas anonymt inom projektgruppen i de fall då inget annat är överenskommen.
- Deltagandet är frivilligt och kan avbrytas när som helst. **Personuppgifter behandlas enligt GDPR.**

## Enkätens två delar:

- Del 1 är generell och kan besvaras oberoende av del 2.
- Del 2 är mer djupgående och utforsande kring specifika sidostömmer för att kunna bedöma potentialen att upcycla med denna

Vi hoppas att du vill fullfölja båda delarna, det ger oss en mer komplett bild av möjligheterna och utmaningarna inom

1

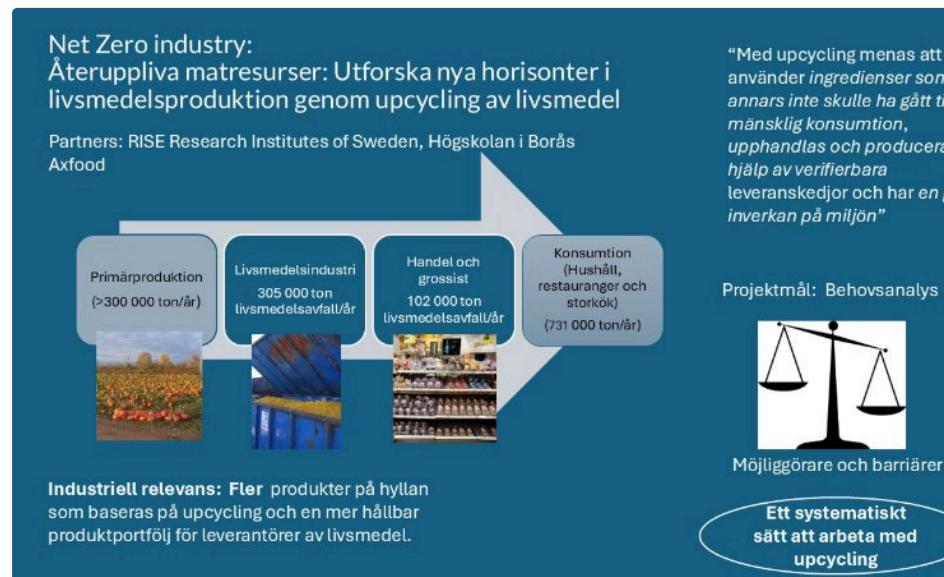
**Genom att klicka på "jag accepterar" samtycker du till att delta anonymt. \***

Jag accepterar.

## Om företaget

2

**Innan du börjar kan du titta på vår projektbeskrivning. Lämna gärna en kommentar i rutan nedan innan du påbörjar enkäten (ej obligatoriskt).**



3

**Yrkesroll:** \*

4

**Bransch/industri:** \*

5

**Företag (valfritt):**

6

**Hur stort är bolaget (antal anställda)? \***

- < 5
- 6-10
- 11-20
- 21-50
- 51-100
- 101-200
- 201-1000
- >1001

7

**Vilken del av företaget representerar du och på vilken ort/län finns er anläggning? \***

8

**Beskriv ert bolags huvudsakliga produkt/tjänst. \***

9

**Vilken är roll inom livsmedelskedjan? \***

- Primärproducent
- Packeri
- Livsmedelsförädlare
- Grossist/lager
- Detaljhandel
- Other

10

**Vilka livsmedelskategorier hanterar ni? Det går att välja fler. \***

- Kött
- Fågel
- Ägg
- Mejeri
- Fisk
- Skaldjur
- Spannmål
- Grönsaker
- Frukt
- Dryck
- Bröd
- Bageri
- Färdigmat
- Other

11

**Hur bedrivs produktutveckling inom ert företag? \***

- Företaget bedriver ingen produktutveckling mot konsument.
- Flera verktyg används rutinmässigt för att säkerställa att produktutvecklingen mot konsument hamnar rätt.
- Intern tillgång till dessa kompetenser saknas, men tjänster kring produktutveckling mot konsument köps in vid behov.
- Other

12

**Utveckla gärna ditt svar på föregående fråga:**

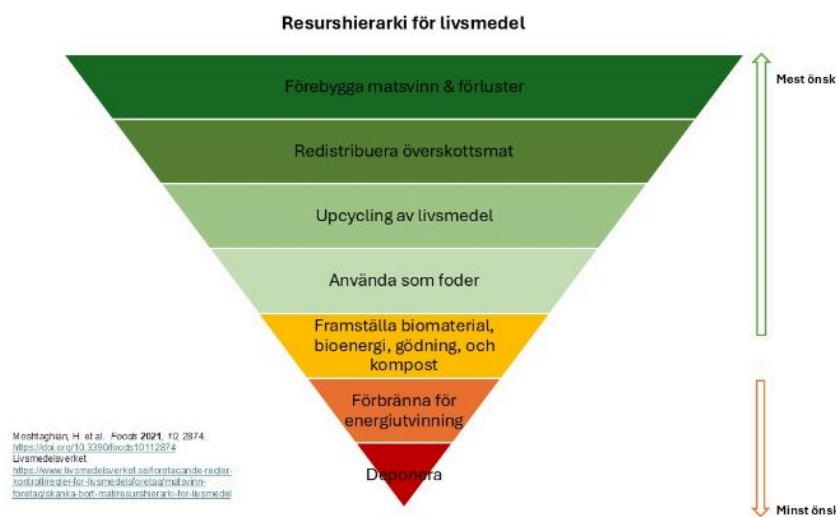
## Strategier

I detta avsnitt vill vi förstå hur ni arbetar med sidostömmer generellt.

13

**Finns det dokumenterade strategier för att förflytta verksamheten uppåt i resurshierarkin för livsmedel (se bild)? Markera de alternativ som stämmer.**

\*



- Nej, det finns inga dokumenterade strategier för att reducera matsvinn eller för cirkulära flöden.
- Ja, det finns dokumenterade strategier för att minska livsmedelsavfallet, det vill säga det som går till avfallshantering.
- Ja, det finns dokumenterade mål för att minska matsvinnet, det vill säga mängden livsmedel som är ätbart men ändå blir något annat.
- Ja, det finns en dokumenterad strategi för att arbeta utifrån cirkulära principer och förflytta sig uppåt i resurshierarkin för livsmedel.
- Other

14

**Ge gärna exempel på åtgärder som ni har genomfört för att förflytta er uppåt i resurshierarkin:**

15

**Hur prioriterar ni följande affärsmodeller för upcycling? \***

	<b>Inte alls intressant</b>	<b>Mycket intressant</b>			
<b>Intern upcycling:</b> vi återanvänder sidoströmmar i egen produktion.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Kommersiell samverkan:</b> Sid strömmar säljs eller avyttras till en annan aktör för vidareförädling till livsmedel.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Ideell samverkan:</b> Sid strömmen skänks till ett socialt företag eller ideell organisation som tar över ansvaret för produkten och säljer eller donerar den vidare.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Joint Venture:</b> Vi samarbetar med annat företag och delar på investering, ansvar och vinst.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16

**Annan affärsmodell:**

17

**Vilka alternativ stämmer för ert företag? Markera de som är relevanta: \***

- Sidoströmmar finns som skulle kunna vidareförädlas i enlighet med principerna för upcycling.
- Sidoströmmar vidareförädlas i dagsläget i enlighet med principerna för upcycling.
- Företaget tar emot och vidareförädlar andras sidostömmar till livsmedel.
- Företaget har sidostömmar men det finns osäkerhet om nyttan med att vidareförädla dem till livsmedel.
- Företaget har sidostömmar som används till andra högvärda produkter (ej biogas).
- Företaget har sidostömmar men saknar rätt kunskap eller förutsättningar för att kunna upcypla dem till livsmedel.
- Other

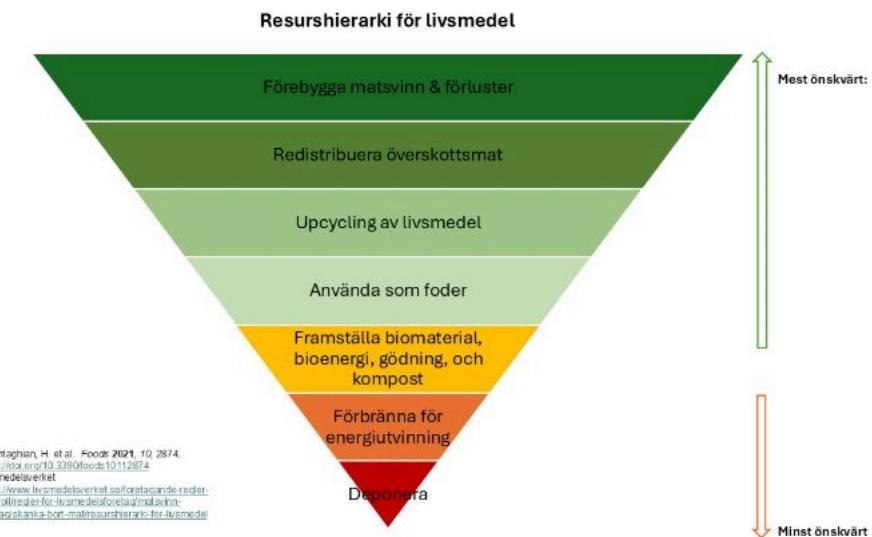
18

**Vilka är de största sidostömmarna inom ert företag som i nuläget blir matsvinn men skulle kunna upcyclas till nya livsmedel? Ge upp till tre exempel utan hänsyn till tekniska och ekonomiska hinder. \***

## Potentialen i era sidostömmar

I detta avsnitt ber vi dig välja **en specifik sidostöm** som för närvarande inte används som livsmedel, men som skulle kunna upcycles. Besvara frågorna utifrån denna sidostöm och dess nuvarande situation.

Med **upcycling** avses förädling av ingredienser som annars inte skulle ha konsumerats av mänskor. Dessa ingredienser skall kunna upphandlas och produceras genom verifierbara leveranskedjor och ha en (potentiellt) positiv miljöpåverkan.



19

I detta avsnitt vill vi veta mer i detalj om potentialen kring specifika sidostömmar i er värdekedja. \*

- En sidostöm finns att utvärdera – fortsätt till nästa avsnitt.
- Ingen sidostöm att utvärdera – gå vidare till enkätens sista avsnitt.

20

Vad består sidostömmen av? \*

21

**Hur stor är sidostömmen (ton/år)? \***

- < 12 ton
- 12 - 120 ton
- 121 - 600 ton
- 601 - 2 400 ton
- 2 400 - 12 000 ton
- 12 000 - 60 000 ton
- > 60 000 ton

22

**Kan sidostömmen samlas in och hanteras utifrån de regelverk som gäller för hantering av livsmedel? \***

- Ja
- Nej
- Other

23

**Utveckla gärna ditt svar på föregående fråga:**

24

**Uppfyller sidostömmen rimliga krav på näringvärdet och ätbarhet för att kunna nyttjas som livsmedel? \***

- Ja
- Nej
- Other

25

**Utveckla gärna ditt svar på föregående fråga:**

26

**Vad händer i dagsläget med sidostömmen? \***

- Den går till extern avfallshantering.
- Den går till intern energiåtervinning ex; biogas och värme.
- Den vidarefördas internt till en annan produkt än ett livsmedel.
- Den vidarefördas internt till en annan livsmedelsingrediens.
- Den avyttras till en extern aktör för vidareförädling.
- Den processas till djurfoder.
- Den doneras till ideell aktör för redistribution.
- Other

27

**Hur hanteras sidostömmen innan det sorteras ut? \***

28

**Hanteringen av sidostömmen innebär: \***

- en nettokostnad
- en nettoförtjänst
- Other

29

**Utveckla gärna ditt svar på föregående fråga:**

30

**Har ni kunskap om hur andra företag hanterar samma typ av sidostöm? \***

31

**Vad hindrar ert företag från att upcycla sidostömmen? \***

32

**Kvalitetsmässiga utmaningar: Kan sidostömmen i fråga användas som den är till upcycling utan att vidareprocessas? \***

- Ja
- Nej
- Other

33

**Utveckla gärna ditt svar på föregående fråga:**

34

**Kvalitetsmässiga utmaningar:** Skulle det krävas en intakt kylkedja för att i ett nästa steg uppcycla sidostömmen till ett livsmedel? \*

- Ja
- Nej
- Other

35

**Utveckla gärna ditt svar på föregående fråga:**

36

**Kvalitetsmässiga utmaningar:** Finns det aspekter kring livsmedelssäkerhet/spårbarhet som sannolikt kräver specifika insatser om sidostömmen ska processas till ett nytt livsmedel? \*

37

**Kvalitetsmässiga utmaningar:** Finns det andra logistiska utmaningar kopplat till att vidareföra sidostömmen? \*

38

**Tekniska utmaningar:** Finns det tillgänglig teknik för att vidareföra den här typen av sidostöm till nya livsmedel? \*

- Ja
- Nej
- Other

39

**Om ja, beskriv tekniken och om den är väl beprövad:**

40

**Legala aspekter: Finns det regulatoriska barriärer för att vidareföra sidostömmer till ett nytt livsmedel? \***

- Ja
- Nej
- Other

41

**Om ja, beskriv de regulatoriska barriärerna:**

42

**Potentiell miljöpåverkan: Kommer det att krävas långa transporter för att etablera en ny värdekedja kring sidostömmen? \***

- Ja
- Nej
- Other

43

**Utveckla gärna ditt svar på föregående fråga:**

44

**Potentiell miljöpåverkan: Kommer det att krävas väsentlig mer energi för att vidareföra sidostömmer till en ny produkt? \***

- Ja
- Nej
- Other

45

**Utveckla gärna ditt svar på föregående fråga:**

46

**Potentiell miljöpåverkan: Kommer det krävas ytterligare ingredienser och/eller processhjälpmaterial för att vidareföra sidostömmer till ett nytt livsmedel/livsmedelsingrediens? \***

- Ja
- Nej

47

**Utveckla gärna ditt svar på föregående fråga:**

48

**Marknad: Om ert företag väljer att upcycla sidostömmer, vilken marknad är då den mest relevanta i det längre perspektivet? \***

- Lokal marknad
- Regional marknad
- Nationell marknad
- Exportmarknad
- Other

49

**Marknad: Vilka ekonomiska förutsättningar skulle behövas för att göra upcycling av sidoströmmen till ett realistiskt alternativ för ert företag (volymer, vinstmarginer etc.)? \***

## Avslutning

50

**Finns det möjliga samverkanspartners kring upcycling av livsmedel i ditt närområde? Lämna gärna exempel:**

51

**Vill du delta i ett kommande webbinarium där vi presenterar slutsatserna från enkätstudien? \***

- Ja
- Nej
- Other

52

**Får vi kontakta dig per mejl för ev. följdfrågor om enkätstudien? \***

- Ja
- Nej

53

**Om vi får kontakta och bjuda in dig till vårt webbinarium, lämna din mejladress nedan:**

54

**Namn och företag (frivilligt):**

55

**Vill du göra något medskick?**

## Stort tack för ditt engagemang!

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RISE Research Institutes of Sweden AB  
Box 857, 501 15 BORÅS, SWEDEN  
Telephone: +46 10-516 50 00  
E-mail: info@ri.se, Internet: www.ri.se

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