BioCannDo

Bioeconomy Awareness and Discourse Project

Report on 3rd Workshop and Focus Group

20 December – 12/2018 (M27)

D5.6: Report on 3rd Workshop and Focus Group – Case Study 3

WP 5

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[1] PU = Public
PP = Restricted to other programme participants (including the Commission Services)
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Summary

The BioCannDo project was born out of the increased need for the development of a more sustainable economy in the European Union. There is a need to switch towards a bioeconomy which would emancipate from the current reliance on fossil fuels. This move towards a more sustainable economy has been on its way for many years, notably in the form of bio-based products. Products such as plastic or detergent can now be fabricated using material from biological origins and are available on the European market. While these products are present on the market, there is a lack of public awareness about them – a gap BioCannDo intends to address. The project is built around three main objectives:

- Develop multi-stakeholder proven key messages for communicating functionality and sustainability aspects of bio-based products with the broader public
- Engage a European stakeholder network dealing with communication issues regarding the bioeconomy in a joint communication undertaking geared towards the broader public
- Create synergies for existing materials and develop missing communication formats and educational material to communicate topics of the bioeconomy and bio-based products to the European citizens

Helping to achieve these objectives the BioCannDo project organises a number of stakeholder engagement activities in three case studies. These case studies centre around a) bio-based household cleaning products, b) bio-based insulation materials, and c) bio-based food packaging materials. In each case study, an engagement with experts (in product expert workshops) and consumers (in focus groups) was organised to get relevant feedback from these different stakeholder groups.

In the third case study on food packaging materials, the product expert workshop took place on 28 September 2018 in Turin, Italy. It engaged 14 stakeholders, who have a professional interest in bio-based products, particularly bio-based food packaging. A majority of them represented (small) businesses, others work in the field of bio-based education or research. In the workshop, the experts were asked to identify the issues producers and retailers face in relation to bio-based food packaging. Secondly, the draft key messages developed to communicate functionality and sustainability aspects of bio-based food packaging to the broad public were discussed with the experts to give them the opportunity to improve these.

After a fine-tuning of the key messages by the project team based on the input from the workshop, 3 consumer focus groups with a total of 24 participants were organised. They discussed the concepts behind the key messages on bio-based food packaging and ranked them according to their personal views. They also identified their expectations towards those materials and previous experiences.

The workshop and focus groups conducted for the third BioCannDo case study highlighted that environmental issues were much more important compared to the first two case studies. Comparatively, functionality seemed less important due to the nature of the product group.

The comparison of the collected issues with the pre-identified key messages shows a large overlap. The participants expressed an overall satisfaction with the key messages and highlighted the importance of having messages of this nature. Yet, participants voiced constructive criticism about several of the developed messages, e.g. a “conversion” into more simple language would be highly appreciated. Further, participants advocated for a less ambiguous phrasing as well as making the case for a more positive language, leaving out neutral or potentially not positive facts.

In conclusion and using the rating and ranking of the key messages, the following topic clusters can be identified which should be emphasised when communicating bio-based food packaging: environmental and climate protection, health, waste disposal, functionality, definition of bio-based packaging and innovation.

A detailed report of the above mentioned, as well as transcripts of the stakeholder engagement activities conducted are presented in the current document and related annexes.

Table of content

PREFACE

This document was produced as a practical guide for consortium members and collaborators to the stakeholder engagement activities conducted in the third case study of the BioCannDo project. It provides site notes and references to existing documents which serve as additional sources of support. The document provides a detailed account of the stakeholder engagement activities and the major outcomes.

The Deliverable is structured as follows:

Chapter 1 provides an overview of the stakeholder awareness and dialogue in BioCannDo
Chapter 2 describes the project's developments and results regarding the workshop
Chapter 3 outlines objectives, design, and results of the focus groups conducted
Chapter 4 provides information on lessons learned from the third case study and next steps

1 Stakeholder awareness and dialogue in BioCannDo

In BioCannDo, Work Package 5 ("Stakeholder Discourse") makes use of advanced and innovative techniques for stakeholder engagement, inspired by a wide array of participatory methodologies (Gramberger 2001). Over the course of the project, and in each case study setting, Prospex together with the project partners organises and facilitates two sets of participatory engagement activities, termed Product Expert Workshops and Consumer Focus Groups.

Three exemplary product and country specific Product Expert Workshops were planned to be carried out at national level (DE, NL, IT) and specifically concentrate on the further development and refining of communicating consumer-friendly key messages as regards bio-based products. They were followed by a series of Consumer Focus Groups, which served as an effective testing ground for the developed key messages.

An ambitious project such as BioCannDo can only achieve genuine impact among stakeholders and citizens, if their involvement becomes an intrinsic part of the project implementation. Through stakeholder dialogue, BioCannDo aspires to create useful outputs that can be readily applied by not only the scientific community, but also the wide array of communicators that work on the advancement of the bioeconomy in Europe.

The feedback and inputs gathered from stakeholders need to be embedded in a reciprocal iterative process of dialogue and co-creation of knowledge (see Gramberger et al. 2015). This approach is reflected in the numerous internal discussions and the decision-making on methodologies to be used within the project. Prospex and WP5-partners (FNR, BTG, Avans) heavily invest in developing a tailor-made process for each of the engagement activities (workshops and focus groups), in co-creation with the other work packages. The participatory integration of stakeholders and consumers is turned into a focus point for the process and the project, intensifying not only the inclusion of stakeholders' perspectives but also, by extension, their engagement with the results.

1.1 Engaging stakeholders and consumers

In BioCannDo, the engagement process is articulated in two sets of participatory activities, each centred on a case study. Hereby, the Product Expert Workshops is held either in English or the national language (depending on the preference of the stakeholders), and the Consumer Focus Groups take place in the national language. The results of these live engagement processes are checked through qualitative market surveys, analysing consumer perception of the bio-based products.

This mixed, iterative and highly interactive process ultimately develops the key messages and most appropriate formats for the communication of the bioeconomy and its end-product applications, as well as related societal and economic issues.

Product Expert Workshops
Within the BioCannDo project, a set Product Expert Workshops engage stakeholders in focused discussions dealing with specific bio-based product. Each one of them focus on representative examples, of the selected

product groups choices[1] including aspects of societal and economic sustainability. These workshops will offer participants opportunities for exchange to identify salient issues related to the communication to the broader public including a common language, misperceptions and sustainability.

Consumer Focus Groups
Following each of the three Product Expert Workshops, case study specific Consumer Focus Groups provide opportunities for direct interaction between the project team and end-consumers, serving as a testing ground for the concepts behind key messages. By involving actual end-consumers in the development of communication messages, the relevance and applicability of the developed material is ensured. Thereby, Focus Group participants are offered the opportunity for strongly engaging with topics of the bioeconomy related to specific bio-based product groups relevant for their daily life. They assess the concepts behind the key messages as a main tool for communicating issues of the bioeconomy and bio-based products to the broader public.

1.2 Target groups

The key messages to be developed by the BioCannDo project will apply to two target audiences – a primary target audience being stakeholders, multipliers and opinion-makers including communicators, suppliers of bio-based products, educational institutions, mass media, politicians and policy-makers, consumer organisations, industry trade associations, research institutions; as well as a secondary target audience being the broader public including end-consumers and young people.

[1] See DoA WP 5 Task 5.1: bio-based products in construction, bio-based packaging and disposables related to food, bio-based cleaning and hygiene products. The selection was further fine-tuned in the run-up to each workshop in the relating concepts (Deliverable 5.1, 5.2 and 5.3).

2 Product Expert Workshop

As outlined in 1.1, the product expert workshop, as the first of the two engagement activities in each case study, aimed at collecting feedback from a wide range of professionals actively involved in the respective product field. This specific approach to the workshop (and focus group) in the third case study was detailed in Deliverable 5.3 "Concept on the third workshop and focus group" that was issued on 31.05.2018 and further refined in the run-up to the workshop in September 2018. The following section outlines the design of the workshop, presents the characteristics of the participating stakeholders and gives an overview of the results. The detailed materials produced in the workshop can be found in Annex 1.

2.1 Workshop design and set-up

Based on the lessons learned from the first and second case study, described in Deliverables 5.4 and 5.5, it was deemed essential to a) link the workshop to an existing network of experts that can assist in generating more interest among stakeholders; b) link the workshop to an existing larger event, which attracts the relevant stakeholders, who would not need to spend additional money on travelling for the BioCannDo workshop; and to c) reduce the length from the originally foreseen one-day workshop to a session of a few hours.

In this light, the project team searched for relevant Italian events in the autumn of 2018 to which the BioCannDo workshop could be linked. In this regard, the International Forum on Industrial Biotechnology and Bioeconomy (IFIB) 2018 was identified as a suitable venue bringing together experts in bio-based food packaging materials from all over Italy and Europe. Additionally, on the same days, several satellite events with related foci were organised primarily by other relevant European research projects. Thus, offering expert stakeholders the opportunity to look at the subject from a variety of angles, evidently made their participation more attractive.

Trying to make the combination of several satellite events possible, meant that the BioCannDo workshop had to be limited to a total of two hours. After a short introduction of the project and the workshop, participants were asked to identify the main opportunities and challenges for 1) producers, as well as for 2) retailers, brand owners and consumers of bio-based food packaging. Participants were hereby encouraged to share their experiences and ideas, which were then collectively clustered into major themes. The second part of the workshop was dedicated to the discussion of the developed key messages for bio-based food packaging. First reading and assessing the developed key messages, participants were encouraged to discuss them and give their detailed feedback on the wording, content and perception. Finally, stakeholders rated all 22 key messages with regard to their comparative relevance.

The agenda of the workshop can be found in Annex 1.

2.2 Workshop participants

As mentioned above, the workshop aimed to bring together stakeholders that work with and communicate about bio-based food packaging in their professional capacity. In this regard, Prospex identified and mapped 65 key stakeholders from Italy and other European countries. Invitations were send out to all stakeholders from the list and the invitation process was complemented by an open invitation to all participants of the IFIB2018.

Overall, 16 stakeholders registered for the workshop, of which 11 participated. These were complemented by 3 stakeholders, who joined without prior registration, based on the open invitation described above. All stakeholders had a professional interest in bio-based products with a majority working with bio-based food packaging on a daily basis. They therefore fulfil the requirements set by the project team. With regard to gender, the workshop participants were represented with 9 women and 5 men.

2.3 Workshop results

As per the design described in section 2.1, the workshop consisted of two distinct sections. The first section dealt with the identification of main opportunities and challenges for producers, as well as for retailers, brand owners and consumers of bio-based food packaging, the second section with the specific key communication messages developed by the project.

The following two sub-sections present the results of the two exercises in turn, more detailed results can be found in Annex 2.

2.3.1 Opportunities and challenges for bio-based food packaging

Table 1 presents the clusters identified by the product experts for each of the two groups. Looking at these clusters it becomes obvious that certain issues are relevant for both producers as well as retailers, brand owners and consumers. These are market (share), communication, technical requirements, properties, and costs. It is not surprising that these points come back in both discussions as they relate to the overall quality and marketability of the product.

Table 1 – Overview of clusters - Opportunities and challenges for bio-based food packaging producers and retailers, brand owners, consumers identified by product experts

Opportunities and challenges for food packaging producers	Opportunities and challenges for food packaging retailers, brand owners, consumers
Bio-based packaging as a resource	-
Market (share)	Market (share)
-	Business activism
-	Definition
-	Health
Communication	Communication
Regulation	-
Technical requirements	Technical requirements
-	Labels
Public perception/ awareness	-
Properties	Properties
Costs	Costs
Environment and sustainability	-

Table 2 - In detail – Opportunities and challenges for bio-based food packaging producers and retailers, brand owners, consumers identified by product experts.

Cluster heading	Producers	Retailers, brand owners and consumers
Bio-based packaging as a resource	Feedstock procurement (PEF, for example)	
	Waste streams as raw materials for packaging materials	
	What is better? Bio-based or recyclable?	
	Bio-based and recyclable & bio-based and biodegradable (e.g. cellulose-based packaging versatile?)	
	Innovative products	
	Supporting infrastructure (research/ tech transfer/ innovators)	
Market (share)	Big market potential – good momentum, consumers are exhausted of plastic packages	Too low volumes available -> too few producers -> price too high
	Bio-based is a strong marketing argument	
	To reach consumer demand for sustainable packaging	
	Find intermediaries – GPP/ procurement – brand owners	
	Increase market share	
	Emerging new niche markets	
	New in the market (less competition)	
	Increase market share including in the market portfolio consumers that are sensitive with environmental impact and sustainability	
	Find a new market	
	Market effect (everything is wrapped up)	
Business activism		How to communicate? Risk of green washing
		To be part of a greener world
		Green washing (image, sustainability)
		To lose the bad image of plastic packaging
		Brand owners set high sustainability targets -> business activism
Definition		What does bio-based mean?
		Bio-based? 90%, all, what?
Health		Better health
Communication	Communicating better sustainability (labels)	Understanding the advantages of these products
		Consumer/ retailer lack of information -> convince!
		Find multipliers (students, teachers…)
		Beyond communication -> information knowledge transfer
		Multi-stakeholder debate to jointly address challenges
		Confusion of consumer concerning waste treatment

Regulation	Meet regulators requirements	
	Regulation standards	
	2030 agenda for sustainable development (UN) and global compact	
	Biosmart, bio-based and sensors will help to give added value to introduce easily in the market	
	New regulations – European strategy for plastics (not binding nowadays)	
Technical requirements	Shape e.g. heart packaging	Appearance (looks/ design)
	'Difficult products' e.g. acid	
	Technical performance of bio-based materials (bio-based and biodegradable -> degrade during use)	
	Functionalities should ensure the same quality/ performance	
	To compare performance of fossil-based materials	
	Meet technical requirements	
Labels		Labelling
		Labelling -> different and confusing
Public perception/ awareness	Awareness and communication/ information	Trust/ security (how to increase it. Not only labels)
	Good image sustainability	The power of eco-consumers!
	Public acceptance (quality 'issues')	
	Find USP to convince the different potential 'buyers' why bio-based?	
	Trust security perception by the consumers	
Properties	Processability	Durability
	Functionality	Better functionalities (solve a problem)
	Packaging properties (meat and other 'fresh' foods)	Increase durability of bio-based packaging, increase performance and odour
	New products/ processes	No additional work by the consumers/ easy to manage/ end of life
		Get the packaging material with the same properties (shelf life)
		Simplify food waste handling
		Material functionality
		Increase food shelf life to reduce food waste
		Shelf life
Costs	Meet cost target	Price
	Costs	To accept the cost
	Costs! In comparison to fossil-based	Price/ costs
	Profits	
	Price/ competition	
	To produce the quantity to the right price	
	Higher cost of bio-based packaging material	
Environment	Improve environmental impact of production	Environmental respect

and sustainability	processes -> competitive advantage	
	Environmental awareness of consumers	Environmental social motivation
	Substitution of fossil-based current sources	
	Sustainability	
	Effect on the environment	
Without cluster		No packaging e.g. 'tattoo' organic boxes
		To be just bio-based is not enough!
		Availability of raw materials & bio-based products (possible impact on the price) especially in under-developed countries

For further clarifying comments given during the discussions, please see Annex 2.

The other clusters show some natural differences between both groups with technical issues being more relevant for the producer side (bio-based packaging as a resource, regulations), while points of relevance for retailers/ brand owners/ consumers included more personal and moral concerns (business activism and environmental responsibilities, health, as well as questions of definition and recognising products through labels). This reflects the nature of the engagement of these groups with food packaging in general. Producers of (bio-based) food packaging tend to be more concerned with questions of production capabilities and the marketability of their products. Hence, topics concerning regulations, feedstock procurement and waste streams are naturally important for this group of stakeholders. For the group of retailers/ brand owners and consumers on the other hand, stakeholders indicated additional challenges and opportunities with a rather moral and personal dimension. Given that this group of buyers is often making a conscious choice for bio-based products, they are concerned with questions of corporate social responsibility and a 'green' image of the products they purchase. In this regard, the topics of defining 'bio-based' as well as communicating it effectively through labels were mentioned as important issues.

2.3.2 Key messages around bio-based insulation materials

The exercises around the key messages were split into two parts, of which the first dealt with each of the 22 key messages and the comments participants had about each of them. The second part evaluated the relevance the participants associate with each of the messages and was carried out as a rating exercise.

In relation to the individual key messages, the participants expressed an overall satisfaction with the approach and highlighted the importance of having messages of this nature. Yet, participants voiced constructive criticism about several of the developed messages. It was for instance indicated that some of the messages employ a too complicated language and a "conversion" into more simple language would be highly appreciated. Further, participants questioned the evidence behind a few of the messages, advocating for a less ambiguous phrasing as well as making the case for a more positive language, leaving out neutral or potentially not positive facts.

In order to identify those messages that have the highest relevance for the communication to consumers, stakeholders were asked to rate all of them on a scale from 1 (least relevant) to 5 (most relevant). Summing up the ratings of all stakeholders shows that the following six topics are the most relevant, starting with the highest ranked message:

- All bio-based food packaging materials must comply with the European health and safety regulations for food-contact materials.
- If a packaging material cannot be reused, recycling is the preferred end-of-life option.

- Bio-based does not mean that packaging is automatically biodegradable or compostable. Bio-based only means that a product is made from renewable resources. It can also be biodegradable, but it doesn't necessarily have to be.
- Especially the use of agricultural by-products as feedstock can have a positive environmental impact, because they don't need to be specifically produced.
- Introducing bio-based packaging is high on the agenda of frontrunners in the food industry. New and even better materials are currently being researched to overcome the current limitations of existing bio-based materials.
- Bio-based food packaging is partly or wholly made from renewable resources such as wood, corn, sugar cane or agricultural residues.

2.4 Workshop evaluation

An official evaluation was conducted with respondents of the workshop participants. Respondents appreciated the workshop in general, as well as the work of the facilitators and project team (100% "very good" for all three aspects). They further appreciated the breadth of perspectives represented in the workshop (85% "very good", 15% "good"). All stakeholders expressed their confidence in their contributions and suggestions being adequately taken up by the BioCannDo project (30% "very good" and 70% "good").

A comprehensive overview of the evaluations received can be taken from Annex 3.

3 Focus Groups

In accordance with the BioCannDo Description of Action, the focus group discussions of the third case study took place in Trento (Italy) on 7 November 2018. Accommodating for participants' varying availability and integrating the exercise into participants' daily activities, the focus group discussion was split in three groups, one during lunch break, one afternoon and one evening session each lasting 1,5 hours. A small reimbursement for participation has been provided to enable consumers to participate in the focus groups. The venue for the discussions was selected to create a comfortable atmosphere enabling open discussions and broad participation. All focus groups of this case study took place at the CLabTrento[2], located in the city centre of Trento.

The Focus Groups brought together current and potential end consumers of bio-based food packaging materials and:

- Served as a testing ground for outcomes of the product expert workshop in Torino (i.e. key messages);
- Checked the relevance of the identified key concepts underlying the developed messages;
- Checked the perception of the key concepts by end-consumers.

In order to facilitate the discussion with consumers in the focus groups, the BioCannDo team (as in the other case studies) distilled the key concepts behind each of 22 key messages. In this exercise it became clear that a few of the identified key concepts were overlapping, ultimately resulting in a total of 19 concepts.

Following a highly interactive format enabling maximum participation by all participants, the focus group discussions have employed tools and methods that allow for easy and quick interactions. This aspect has been assessed as highly relevant, considering the participants' diverse backgrounds with regard to education, knowledge of bio-based products, age, and gender. The discussion format was therefore conscious of utilizing easy language and as little methodological introduction as possible.

3.1 Participants of the Focus Groups

Aiming to arrive at a balanced and pluralistic set of perspectives, demonstrated by a variety of potential end consumers from different ages, gender, and working backgrounds, limits potential biases and strengthens the research outcomes.

Against this background, the BioCannDo consumer focus groups have predominantly focused on arriving at both a representative sample and at the relevance of the identified product line to the individual. Prospex has reached potential end consumers through 1) strategically post an invitation on a dedicate Facebook group for people interested to participate in research projects, experiments and surveys as consumers, 2) through direct contacts; as well as 3) through community centers in Trento.

A detailed overview of the focus group participants is displayed in Table 3 below:

Table 3 - Overview of the focus group participants

	Focus Group 1	Focus Group 2	Focus Group 3
Female	5	4	2

[2] **CLab Trento** is the interdepartmental laboratory of the University of Trento, and is part of the CLab Network, a network of Italian universities. Networking, sharing, generating innovation are the foundations of the CLab.

Male	4	6	3
Under 30	7	5	4
31 – 50	2	4	1
Over 51	0	1	0

Profession/Principal activity

Student (13), Office worker (2), Un-employed (2), Freelance (1), Researcher (1), Social worker (1), Writer (1), Neuro-psychologist (1), Entrepreneur (1), Speech Therapist (1)

Annex 4 provides a detailed account of the participant profiles.

3.2 Structure of the Focus Group

The Focus Groups have been designed and structured following the below elements:

a) **Introduction and Exercise 1 – Consumer Choices**: At this point no details on the project or the focus on bio-based food packaging were given. Enabling an unbiased discussion and exploration of factors influencing consumer choices, participants were asked to explain their preferences/ previous choices in food packaging across three product groups: fluids (milk), fresh produce (tomato) and dry produce (coffee). Subsequently they were asked to provide reasons for their choice.
b) **Introduction to the bioeconomy and bio-based food packaging**: Short description of the bioeconomy and bio-based food packaging were given, including clarifications on language issues.
c) **Exercise 2: Expectations towards bio-based food packaging:** Exploration of participants' expectations regarding bio-based food packaging and clustering of answers around bigger themes.
d) **Introduction of BioCannDo key concepts:** Short introduction of the 19 key concepts developed by the project and matching, if applicable, of these concepts with participants' corresponding concepts identified in exercise 2.
e) **Exercise 3 - Voting on clusters:** Interactive session to rank the key clusters according to their relevance and importance for participants.
f) **Closing and next steps**: Short presentation of how the outcomes of the Focus Group will be used in the next steps of the BioCannDo project.

3.3 Summary of the Focus Group

The format of the Focus Group has been largely successful, achieving all set objectives and providing valuable and crucial input to the further advancement of the study.
When exploring participants' consumer choices, a few patterns could be examined in the focus groups. These are listed below together with an overview of the voting exercises' outcomes and consumers' priority influences.

- **Prize -** Across all groups, participants indicated that the price of food packaging and their own financial situation is a decisive factor determining their consumer choice. A majority of participants expected bio-based food packaging to be more expensive. Otherwise, many of them have declared to be really impressed about the bio-based packaging and to be really motivated in buying it in the future.
- **Economic situation of the buyer:** Many of them, especially people under 30, have reported to live with their family (more than one parent) or only with one of their parents. A consequence of this is the fact they are often choosing food and drinks because of their family food habits.
- **Self – sufficiency**: In the first and the second focus groups, participants highlighted an important aspect of Italian culture and food choices, connected with personal food habits. Many of them mentioned their own vegetable garden as primary source for fruits and vegetables, and self-

sufficiency. They prefer this kind of products because of the better taste of the foods, economic advantages, and for avoiding the industrial production of the products and the food packaging. At the same time, they stressed the presence of high number of students and young workers in Trento, which cannot provide fresh food by themselves. Many students took part in the focus groups, and they preferred buying food in the supermarket because of many discounts and the size of the packaging (single household packaging). In these cases, participants had to make a choice between avoiding food waste or avoiding extra packaging.

- **Tradition:** Another crucial factor that emerged from the debates can be found in the important role of tradition. Many participants mentioned that the quality of some products is more important than the price or the packaging. So, it could be a good option to package the most commercial products in bio-based materials and to engage as many brands as possible for changing the industrial production.
- **Design:** the participants of the second group mentioned an important aspect for encouraging people to buy bio-based food packaging. The design of the bio-based food packaging should be more ergonomic and attractive.
- **Ethics and Fair Trade:** this topic has been stressed in two different views, the first concerns the production of the packaging, that should be sustainable, green and not too expensive. The second one regards the workers' rights involved in the production system, especially if they are working in developing countries or in social cooperatives in rural areas.
- **Awareness:** When introduced to the concept of bio-based food packaging and asked for their expectations regarding bio-based food packaging, participants mostly had not been previously aware of the concept of the bioeconomy.

Respondents indicated the following **expectations regarding bio-based food packaging:**

- More expensive
- The food is biologic
- The food is fresh and natural
- More fragile
- It requires a lot of research and innovation
- Biodegradable
- Less resistance
- Bad smell
- More information and awareness
- Environmentally friendly
- High costs of production
- Renewable
- Distribution
- Disposal
- Quality
- Food safety
- Sustainable production
- Fair trade
- Ethics
- Aesthetics
- Food design
- Pet-friendly
- More healthy
- Ergonomic
- Less heavy
- Less costs of production
- A new opportunity for job market
- Less available

Table 4 Overview of respondents' priorities (measured through votes). Only clusters that received votes are listed below. For a full overview of all identified clusters, please see Annex 5

Clusters	Focus Group 1 (N=9)	Focus Group 2 (N=10)	Focus Group 3 (N=5)	Overall votes
Price (more expensive)	4	1	4	**9**
Less CO2 emissions	3	5	1	**9**
Better taste of the food	1	4	1	**6**
Health and safety	4	1	1	**6**
Disposal	1	4	0	**5**
Environmentally friendly	0	1	3	**4**
Research and Innovation	2	1	1	**4**
Better functionality	1	1	1	**3**
Renewable raw materials	1	2	0	**3**
Agricultural derivative as raw materials	0	2	0	**2**
Ethics	0	1	1	**2**
Availability	1	0	1	**2**
Less raw materials	0	1	1	**2**
Recycling	1	1	0	**2**
Cultivation of raw materials	1	0	0	**1**
Less packaging	0	1	0	**1**
Pet-friendly	0	1	0	**1**
Can be used for many products	0	1	0	**1**
Aesthetics	0	1	0	**1**
Better food quality	0	1	0	**1**

Summing up the votes of all stakeholders shows that the following four topics are the most relevant:

- Price
- Less $C0_2$ emissions
- Better taste of the food
- Health and safety

In general, it can be observed that the consumer choice of food packaging materials appeared to not be guided by emotional responses but rather by rational arguments, safety considerations and functionality. Against this background, participants of the focus groups largely indicated an interest in more information and learning about the materials' characteristics.

Annex 5 presents a record of the discussions and accounts provided in the three focus groups.

3.4 Evaluations of the Focus Groups

An official evaluation was conducted with respondents of all three focus group discussions. Respondents appreciated the format and implementation of the small focus groups and highlighted the learning aspect of the event. Many reported that they would now be more aware of the existence of bio-based food packaging and would appreciate to be informed of the results. They also mentioned the need to be more aware about this topic, comparing results among European countries and organizing discussion at national level.

A comprehensive overview of the evaluations received can be taken from Annex 6.

4 Conclusions

4.1 General conclusions and next steps

The findings of the presented third case study will be taken up by the BioCannDo consortium and will be fundamental in informing the development of both case study-specific, as well as broader and widely applicable communication messages about the bioeconomy and bio-based products (see also section 4.2).

Lessons learned regarding stakeholder engagement formats employed in case study 3:

Building on the experiences from the first two case studies and including the lessons learned from the third case study proves that the high degree of flexibility with regard to timing, format and type of engagement proved to be very helpful and essential in addressing the specificities of this product group.

The engagement of product experts in a short workshop linked to another relevant event has proven highly successful.

Since the focus group discussions in the first and second case study worked really well, achieved all set objectives, and gathered the appropriated number of consumers, there was in principle no need to change the envisioned set-up for the third case study. The approach of a mix of Facebook campaigns, contact via gate keepers and multipliers, personal contacts and relevant internet portals has proven to be a good tool for raising awareness about the event and motivating consumers.

The strategic decision to organise several instead of one central focus group accommodated for participants' varying availability and enabling greater participation by different consumer groups. Further, feedback received by focus group participants highlighted the suitability and appropriateness of 1,5 hour long sessions. Participants confirmed the effectiveness of a small reimbursement for participation as an incentive to attending the focus group.

4.2 Conclusion for further key message development

A number of recommendations can be drawn from the results of the workshop and the focus groups. In principle, it can be stated that the public perception of bio-based food packaging is still assessed as insufficient by the participants of the product expert workshops and the consumer focus groups.

Overall, it can be said that both the experts in the workshop and the participants in the focus groups attached very high relevance to the topics of environmental and climate protection. At the same time, the importance of the functionality of bio-based packaging was assessed as lower. Thus, the third case study differs from the two previous case studies, in which functionality was considered to be at least as or even more important as environmental protection. This is not surprising when one considers the character of the food packaging product group. In the case of (food) packaging, a direct reference to the environment is made, because it is a fast moving consumer product and the resulting quantities of waste are immediately obvious to every user. In addition, there is the virulent debate about plastic pollution (in particular) of the oceans. At the same time, it can be assumed that most consumers are hardly aware of the different functionalities of food packaging or that these are simply taken for granted.

In both, the experts and consumer groups, the topics of health, safety and disposal were given very high importance.

The topic of "better taste" was perceived very differently by the focus groups and the experts. The focus groups considered this aspect to be very important. In the ranking of the messages by the experts, however, the corresponding message received the least votes. This is probably due to the fact that the statement was questioned, although a corresponding scientific study is available. Based on the expert's assessment, a separate message is not given in order not to jeopardize the credibility of the messages. Instead, this information is presented in the background information with references to the study.

As new topics i.e. not yet covered by the key messages, "price/costs" and "labels" were raised.
Although highly important, it is difficult to capture these aspects in general key messages. Corresponding labels are not available and developing a bio-based label specifically for packing material is not deemed very relevant" A clear communication on the product about the used raw materials and their cultivation as well as about the best disposal route of the packaging appears more helpful.

In conclusion and using the rating and ranking of the key messages, the following topic clusters can be identified which should be emphasised when communicating bio-based food packaging: environmental and climate protection, health and waste disposal, functionality, definition of bio-based packaging and innovation.

For the further fine tuning of the messages, the proven structure from the previous case studies will be used. This allows information to be displayed in different depths of detail.

- 1st level: five-six broad key message (topic cluster)
- 2nd level: specifying messages
- 3rd level: background information with explanation and further sources

This should also take into account the feedback from the workshop that some participants considered the messages to be too simple, while others argued for further simplification of the messages.

This project has received funding from the Bio Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 720732.

Annex 1 – Agenda of the Product Expert Workshop

European BioCannDo Project
Workshop on bio-based food packaging

Torino, 27 September 2018 - h. 14:30 - 16:30

Room Principi d'Acaja, University of Turin, Via Giuseppe Verdi, 8, 10124 Torino TO

AGENDA

Thursday, 27 September 2018

14:15	Registration of participants
14:30	Welcome to BioCannDo
14:45	Bio-based food packaging – In focus
15:30	Key communication messages on bio-based food packaging in review
16:20	Closing
16:30	End of workshop and coffee

Facilitation: Martin Watson & Katharina Faradsch, Prospex

Please note that this is a highly participatory workshop and that timings and content of individual sessions are subject to change.

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Annex 2 – Notes of Product Expert Workshop

1. Issues for bio-based food packaging material

Participants were asked to individually answer two questions. Their answers were clustered and are presented below.

1.1 Issues for producers

Question: What are the main opportunities and challenges for producers of bio-based food packaging?

Opportunities

- meets regulatory requirements – many business in which this is an obstacle, if we are able to overcome this, this could be an opportunity
- New emerging niche market – consumers that are more oriented towards sustainable products – demand side is growing
- Environmental impact of the production process and material itself – competitive advantage of those products, good selling argument; material with great environmental performance can be an argument
- More sustainable to substitute the fossil based ingredients and improve the environmental impact of food-packaging solutions
- Increase market... bio-based seems to be better from the environmental perspective, issue with the contamination of bio-based plastic; mitigate the issue of having final end-use more sustainable e.g. if a spill has been; waste of food-packaging if it goes with bio-compostable – higher and easy to handle, not necessary to separate the waste …
    - Q: not an expert of composting – heard it is not ok to put the waste on the compost with the food
    - A: obliged to use compostable packaging for food, it is mandatory
- New regulations and the European Strategy for plastics
- Big potential market…– we did some surveys in bioways – good momentum, people are sensitive and ready if you use the correct argument
- Good image of sustainability – people might not want to buy bioplastics because they are supposedly less resistant but as soon as it reaches the market – it has a much better image
- New products and new processes
- Increase the market share
- Find a new market
- Substitution of fossil-based resources
- Reach consumer demand for sustainable packaging
- Consumers environmental awareness
- Global Compact and SDGs
- New innovative products – different from competitor
- Market effect (everything wrapped up)
- Bio-based is a strong market argument
- Bio-based waste streams are a good source of raw materials, don't compete with food feedstock

- Cellulose based packaging – quite versatile, either recycle as back to fibers in technical cycles or degrade it in biological cycles – clear opportunity if I have my packaging that can be recycled in different cycles
- New in the market

- Q: what is better bio-based or recycled? No answer - both

Challenges

- price and competition – each producer of bb packaging has competition and especially non-bb packaging – costumer is price-sensitive and is not willing to pay 5 cents more just for the packaging
- Meet the technical requirements
- Need to find a unique selling point to grab the opportunity
- To produce the quantity to the right price
- Public acceptance (e.g. quality issues) – some people think that the quality is not as good as the case with traditional ones
- Packaging properties – meat and other fresh food needs to meet certain regulatory issues in regard to packaging
    - Q: more related to functionality?
- Material processability
- Costs
- Regulations and standards
- Costs have to be lower than with fossil-based resources
- To compare performance of fossil-based materials
- Feedstock procurement
- Shape of packaging
- Resistible against insects
- Higher costs
- Technical performance of bio-based packaging materials, in Sweden there are examples of materials decomposing in storage facilities – not good enough yet
- To be just bio-based is not enough – you have to be good in performing
- Reception
- Need to find a unique selling point covering most of these issues – why go for bio-based – public perception
- Communication – how to communicate
- Need support in infrastructure – tech transfer, incubators – increase costs and scale up
- Need to find final buyer and intermediaries that could be green public procurers and brand owners
- Public acceptance, trust and security
- Functionality should be the same performance
- To be just bio-based is not enough – bio-based reception in order to demonstrate that packaging is in good condition, shelf life
- Functionality – how to communicate that you are more sustainable if that is the case
- Profitability

1.2 Issues for retailers/ brand owners and consumers

QUESTION: From a retailer/ brand owners and consumer point of view, what are the main opportunities and challenges for bio-based packaging materials?

Q: Same perspective?
Brand, retailer and think a little bit for the costumer

Opportunities:

- Consciousness – to be part of a greener world
- No packaging at all - trend especially for organic products – some retail shops use boxes
- Increase food shelf life to reduce food waste
- Increase durability and performance
- Better health
- Environmental aspect – sustainability
- Environmental motivation
- Brand owners set very high sustainability targets (e.g. IKEA) – business activism
- Power of end-consumers – eco-consumers want to have more – driving force
- If packaging producers collaborate - higher quantities can be ordered
- Business activism
- Packaging with the same properties (shelf life)
- Raw materials could be waste product – possible impact on the price and availability
- Multi-stakeholder debate - Beyond communication but rather knowledge transfer

Challenges:

- Price – if I only buy organic that is expensive
- Durability
- Appearance – how does it look/ design – needs to look as good
- Lack of information from the consumer point of view – lack of trust, so many products are labelled as bio even though they are not
- Retailer – hard task to convince consumers
- Labelling
- Simplify food waste handling
- What does bio-based mean – in Italian bio means organic – huge problem, consumers need to understand what we mean by bio-based
- Understanding the advantages of these products
- Cost of producing something new and being willing to pay more
- Greenwashing – to be or not to be
- We shouldn't have to make the consumer work – they shouldn't think about problems with too much information, we have to simplify the process otherwise they will not accept it – cannot increase the complexity
- Find communication multipliers like students, teachers – how to increase the public perception
- Trust and security – not only about labels but have to find additional ways to communicate sustainability
- Need to have better functionalities
- Different labels are very confusing for the consumers
- How to communicate if I am a brand owner – risk of greenwashing
- Material functionality – needs to be even better than traditional
- Too low volumes availability, too few producers, too high prices
- Shelf life and price
- Confusion of the consumer concerning waste treatment - very political issues to burn the waste

2. Key messages around bio-based insulation materials

The exercises around the key messages were split into two parts, of which the first dealt with each of the 22 key messages and the comments participants would have about each of them. The second part evaluated the relevance the participants associate with each of the messages and was carried out as a rating exercise.

Key Message Number 1: Bio-based food packaging materials offer new properties which are advantageous for some applications (fruits, vegetables, salads) compared to fossil-based food packaging materials.
Comments by participants:

- Very unclear which these new properties are or can be.
- What properties? (specify); 'for some applications (fruits, vegetables, salads)' → these are foods! Packaging is not foods.
- What are the properties? Maybe with the right additives…
- Add examples, because this is not always true.
- New properties: which ones? Promote them very clearly.
- Too general, can be mentioned in certain cases, but only in specific cases.
- If I understand well, better breathing properties.
- Why not for other products? And will it have an effect on the taste? → Examples of questions from consumers.
- Please specify (new properties such as…) at least one example.
- 'New properties' – which exactly?; 'advantageous' – pretty general comment: all properties are advantageous?
- Which properties?
- Not for all, but for some it can be.

Key Message Number 2: Bio-based packaging can help to avoid food waste by keeping perishable food such as lettuce or bread fresh longer compared to conventional packaging materials.
Comments by participants:

- Clear statement but is it true?
- OK but 'avoid' should be 'reduce'
- It's not a matter of BIO.
- Some…
- It has to be demonstrated clearly and promoted clearly.
- Too general.
- Yes it is. Additionally, it can increase lifetime of food, especially in combination with bio-smart sensors with MAP packaging (controlled atmosphere).
- Technical barriers to overcome. But not [illegible] statement for consumers.
- Instead of 'avoid' – 'to reduce' (I think it's better).
- 'Bio-based packaging can' – vague (will is stronger)
- I think it's not correct.

Key Message Number 3: Bio-based materials can improve the taste of packaged fruits such as blueberries.
Comments by participants:

- It sounds so nice but is it true and is this allowable? Migration of chemicals from packaging to product or similar?
- Really? If this message is put on a label, it has to be proven!

- Really? This is just marketing!
- I didn't know it…
- It has to be demonstrated clearly and promoted clearly.
- Depends on the 'quality' of the alternative material.
- If improve breathability can be or combined with biosmart sensors.
- There is no need for that; focus on quality, sustainability and price of bio-based packaging with traditional functions → improve the taste??
- Really?
- Do not believe it

Key Message Number 4: Some bio-based materials require fewer resources because thinner packaging can be applied.
Comments by participants:

- I doubt that. The material can be lighter because of the weight of this raw material or due to reducing the material in a special way.
- Really? In my experience it is difficult to process bio-based materials… thin and pinholes are brittle.
- At present, this is not true. It depends, of course, on the comparison material.
- Which type of resources?
- Yes,… some.
- The important thing is to increase the strength/ weight ratio and the chemical properties are usually lower.
- Good as a message for consumers.
- 'Some' – be exact; 'because thinner packaging' – implies that the quality is better…true? (not sure); 'can be applied' – be strong with arguments and believe in them.

Key Message Number 5: Bio-based food packaging is partly or wholly made from renewable resources such as wood, corn, sugar cane or agricultural residues.
Comments by participants:

- Not only these resources – algae, wood parts, like lignin?
- OK, not only…
- Respecting the environment and not in competition with food resources for humans.
- General understanding – I always wonder if the general public knows about starch or other terms?!
- Partly, to what extent? As a consumer it makes me lose my trust. It may be 27 renewable, bio-based and the rest still fossil-based…and these resources are only renewable sustainability!
- PLA is fully made of renewable I think but Bio PE, BioPET are partially made of renewable sources.
- There are other options.
- This group of contents (5-9) are not informative and credible
- Do not know, are there other resources?

Key Message Number 6: Paper and cardboard are traditional bio-based packaging materials.
Comments by participants:

- Paper definition? There are many innovative papers available nowadays. Too simple comment!
- Too much 'traditional' – what does this really mean?
- Ok if message 6 and 7 are put together.
- People/ consumers do not even know about bioeconomy, how should they know about starch and all other terms related to it.
- It helps to understand that a bio-based products doesn't necessarily have to be a high-tech product.
- A mix with plastic can be the right way to get the barriers, food safety and safe plastic.
- Yes. Does it mean that it has been around for centuries or just that it's the most used material? What makes the difference of bio-based?

- Put message 6 and 7 together – compare traditional and new innovative.
- Yes they come from cellulose fibres.
- The quality of paper and cardboard can be quite different. Further information is necessary.
- This group of contents (5-9) are not informative and credible
- …But containing many not-friendly additives.

Key Message Number 7: New and innovative bio-based packaging materials include bio-based plastics, starch- and cellulose-based products and composite materials.

Comments by participants:

- Very relevant message. This is what has to be stressed.
- Ok if message 6 and 7 are put together.
- What are the 'old' and 'non-innovative' bio-based packaging materials? Cellulose is not an easy term, nor composite.
- Put message 6 and 7 together – compare traditional and new innovative.
- Yes, composite or nanocomposite materials are being developed to increase strength/ weight.
- And, and, and…
- This group of contents (5-9) are not informative and credible
- Agree, as far as I know.

Key Message Number 8: Bio-based packaging is suitable for many products such as dairy products, yoghurt, biscuits, beverages, ready meals and fresh products such as fruits and vegetables.

Comments by participants:

- 'Bio-based' – too general term here
- What is the difference from fossil-based materials in this sense?
- Not sure if it is useful. Better to put the attention on 'compatibility' tested with categories of food.
- For which products isn't it suitable and why?
- We are working in biosmart project with meat, fish, fruit, cheese.
- …but you have also the option of no packaging at all.
- Maybe yes, but too vague.
- I do not know.

Key Message Number 9: Bio-based does not mean that packaging is automatically biodegradable or compostable. Bio-based only means that a product is made from renewable resources. It can also be biodegradable, but it doesn't necessarily have to be.

Comments by participants:

- Good but does not mention the 'other' side → explain what is bio-based and non-biodegradable and why!
- This is a key message. Bio-based/ bio-degradable/ compostable etc – often general misunderstanding in sentences.
- Useful and necessary to clarify to consumer!
- I would say that this is not a positive message. Why mention it at all?
- I like especially this one.
- Very important message to share!!
- It's true!
- Yes, it is also compostable, can be good for organic waste (food waste) handling.
- … too general.
- This group of contents (5-9) are not informative and credible.
- Ok, but if it would be biodegradable too, it would be much better.

Key Message Number 10: Bio-based packaging materials can contribute to more environmentally friendly packaging, but they are not automatically more sustainable than fossil-based packaging materials.

Comments by participants:

- Remove the first packaging – the second part of the proposition is not perceived by the consumers! Maybe a question is are they really more sustainable than fossil-based materials.
- Yes.
- OK but if No.10 is true, No.12 is not true!
- Not clear, what do you mean? Too much generic, consumers don't understand.
- Good! But does not explain why not automatically more sustainable.
- Not easy to understand for audience.
- Please look over the whole process.
- 'Can' – be stronger → 'will'; 'but they are' – why 'but' – this brings up unnecessary questions.
- Yes sustainability is often measured by means of LCA and processing of bio-based materials should still improve in terms of energy consumption and yield.
- Better avoid such messages that can lead consumers to give up. I would rather phrase it in a positive manner: what should happen for it to be more sustainable than fossil-based packaging.
- Instead of 'can' – 'may'

Key Message Number 11: Prevention, reduction, re-use and recycling of food packaging are the most important steps to reduce the environmental impact of packaging. Bio-based packaging materials are no solution to littering.

Comments by participants:

- They are part of a more sustainable approach.
- Yes.
- Not able to understand.
- Explain why! Should be 'recycling of food packaging waste'.
- Also compostable materials?
- That is for me the key message.
- 'Prevention, reduction, re-use and recycling' – does the consumer know these terms?; 'Bio-based packaging materials are no solution to littering' – those sentences kill the purpose. Consumer: "Oh it's not the solution, then forget about it and move on."
- I would avoid the use of 'prevention' because it is hard to understand for the general public.
- Recycling, reuse, reduction are very important for sustainability of fossil fuel based and bio-based, not compostable. Compostable plastics are especially important often handling food waste and to minimize ocean waste.
- Very important message. These alternatives are not solutions to the plastic problem, only help reducing it. Single-use plastic for instance is bas, bio-based is not.
- Not clear.

Key Message Number 12: Using bio-based feedstock such as wood, corn or sugar cane causes less CO_2 emissions and helps to keep fossil-based feedstocks such as crude oil in the ground.

Comments by participants:

- Who cares? About keeping the crude oil in the ground.
- Yes but this is very general.
- 'Causes less CO_2 emissions' – arguable.
- Respect the environment. Can be reductive, may be! New sources are emerging…
- 'oil in the ground' too simple language!
- What about the use of wood, corn, straw, etc. In terms of consumption and/or side effects?
- 'Less CO_2' – how much?

- Yes since when growing the renewable sources it is incorporating CO_2, then it is possible to be CO_2 neutral in their life cycle. Fossil fuel derived plastics have limited life (they are not easily renewable).
- Yes but it has to be carved out in a sustainable way, avoiding food competition and land depletion.
- It depends.

Key Message Number 13: Bio-based packaging materials contribute positively to the environment provided the biomass used in its production is cultivated and processed according to standards aimed at ending deforestation and protecting biodiversity, soil, water and air.

Comments by participants:

- Yes but see other points.
- Crucial!
- OK.
- What are the standards?
- Very long sentence.
- Yes protocols for cultivation (minimising pesticides) for minimising waste during production can help to improve their lifecycle.
- Again, yes, but it doesn't mean we can keep up the packaging at the same rate. How to also inform that?
- It's more complex.

Key Message Number 14: Especially the use of agricultural by-products as feedstock can have a positive environmental impact, because they don't need to be specifically produced.

Comments by participants:

- Add circularity concept.
- Yes but they could be also used for other purposes. In addition, transport costs must be considered.
- They are waste to be valorised for new uses (circular economy).
- Not necessarily though it implies lots of transportation around (e.g. local production is good).
- Ok, a little bit simple.
- Agricultural by-products can be very positive sources as starting points of biofood.
- Should be 'The use of agricultural by-products will have a positive environmental…' – delete the rest because too much information and include 'will' – change because of attitude
- This is related to the circular economy.
- This is a good message. Challenging for consumers to know the exact source of the bio-based packaging they'll buy.

Key Message Number 15: Currently, only 0.016% of the global agricultural land is needed to produce renewable resources for bio-based plastics.

Comments by participants:

- But all kinds of 'waste' could be used for the production of bio-based plastics.
- No competition with food for humans.
- Good! Straight-to-the-point fact.
- Is this more current production rate.
- The use of numbers is positive.
- In the BioCannDo report, I read 0,005%, please check the figure.
- This is misleading, it doesn't say that bio-based plastics are only 1% of total plastics… what if they become the main sort of plastic?
- I like this one.

Key Message Number 16: All bio-based food packaging materials must comply with the European health and safety regulations for food-contact materials.

Comments by participants:

- Good!
- OK.
- This is why sentence No.3 is wrong.
- OK.
- Agree.
- Yes, but this is the legislation – not very convincing argument.
- Yes, of course.
- Of course, otherwise it will not work, right?

Key Message Number 17: The best option for disposing bio-based packaging depends strongly on the application of the packaging material and the available waste infrastructure.

Comments by participants:

- Agree.
- 'On the application of the packaging material' – What does it mean?
- Yes.
- Food waste contaminated packaging preferably should be bio-compostable should be composted. Bio-based packaging should be preferably recyclable especially if it is not compostable.
- I think there should only be one 'best option' and be clearly communicated. Need to upgrade the infrastructure before product reaches the market.
- Is this relevant for consumers?
- Why raise problems and issues?
- This statement is not so helpful if I need to know what is the best option ☺.
- Too much generic, difficult to be understood by a consumer.
- Not only, cost is a 'must'; packaging (bio or fossil-based) is just a commodity.

Key Message Number 18: If a packaging material cannot be reused, recycling is the preferred end-of-life option.

Comments by participants:

- Agree.
- Maybe an example of reuse could help.
- Yes but avoiding would be better.
- Yes this applies especially to not compostable bio-packaging and non-food waste compostable packaging.
- 'Reused, recycling' – Does the consumer understand the terms?
- OK. Not sure if necessary to be so 'strong' – bio-degradation can be another good end-of-life option.
- Recurrent factor.

Key Message Number 19: Theoretically, all bio-based packaging materials can be recycled, but for most new bio-based plastics recycling systems are not yet established.

Comments by participants:

- Important issue.
- These are also regulatory issues, at least in Italy.
- But often this is not feasible because of the organisation in a city or village.
- Yes recycling systems and process and their scale up process should be further developed.
- This should be often shared with the public, otherwise is misleading. Need far more action. Not to my [illegible] biodegradable.

- What is with multi-layer products?
- Maybe this could be expressed in a positive way…but plastics recycling systems for most new bio-based products still need to be established.
- I'd like to see messages which underline only good and advantageous parts of bio-based packaging.
- OK.
- This is a key point.

Key Message Number 20: If a bio-based packaging material cannot be recycled, energy recovery through incineration or biogas production is the preferred option.
Comments by participants:

- Better to recycle it, I would humbly say.
- Depends on the structure in a specific area.
- Composting?
- Biogas production is preferred to improved to food waste. Incineration is preferred for bio-contaminated bacteria, virus (medicinal waste).
- Energy and gas should be best option (other sources). Prioritize materials needed – cascade.
- What has that to do with me?
- I don't like such sentence. If a bio-based packaging material cannot be reused or recycled, could be bio-degradable or compostable sometimes.
- As for the fossil-based material.

Key Message Number 21: Composting can be a good disposal option for some special applications if a collecting system for organic waste is in place. In general, recycling and energy recovery should be preferred.
Comments by participants:

- Recycling always first composting might have high cost and high energy consumption.
- Why?
- Related costs might be too high.
- Yes it is correct, when organic waste is combined with bioplastic, composting to biogas preferable.
- Energy should be the best option. Cascade.
- I am not sure if the second sentence is well-connected to the first one.
- Not of interest to the consumer.
- Recycling and composting are on the same level in waste hierarchy!
- Second sentence not necessary.
- Is it true? Really?

Key Message Number 22: Introducing bio-based packaging is high on the agenda of frontrunners in the food industry. New and even better materials are currently being researched to overcome the current limitations of existing bio-based materials.
Comments by participants:

- Good move.
- It seems too vague – you need to communicate now what they can profit from.
- Price is a very important issue concerning the acceptance from consumers.
- This message is not clear.
- OK.
- Best message ever.

3. Rating of all key messages bio-based food packaging

Looking at the 22 communication messages below, which do you rate as the most important in communicating about bio-based food packaging? Assess all 22 messages in terms of their relevance (1 = least relevant, 5 = most relevant). Make your choice clear by drawing a cross in the column of your choice.

Overview table of all ratings combined. Messages order by overall score:

No*	Key message	Rating (1= least, 5 = most relevant), total number**					Overall score***
		1	2	3	4	5	
16	All bio-based food packaging materials must comply with the European health and safety regulations for food-contact materials.	0	0	1	6	5	52
18	If a packaging material cannot be reused, recycling is the preferred end-of-life option.	0	0	3	4	5	50
9	Bio-based does not mean that packaging is automatically biodegradable or compostable. Bio-based only means that a product is made from renewable resources. It can also be biodegradable, but it doesn't necessarily have to be.	2	0	0	5	5	47
14	Especially the use of agricultural by-products as feedstock can have a positive environmental impact, because they don't need to be specifically produced.	0	0	5	3	4	47
5	Bio-based food packaging is partly or wholly made from renewable resources such as wood, corn, sugar cane or agricultural residues.	1	1	3	1	6	46
22	Introducing bio-based packaging is high on the agenda of frontrunners in the food industry. New and even better materials are currently being researched to overcome the current limitations of existing bio-based materials.	0	2	3	2	5	46
10	Bio-based packaging materials can contribute to more environmentally friendly packaging, but they are not automatically more sustainable than fossil-based packaging materials.	0	2	2	5	3	45
11	Prevention, reduction, re-use and recycling of food packaging are the most important steps to reduce the environmental impact of packaging. Bio-based packaging materials are no solution to littering.	0	2	3	3	4	45
19	Theoretically, all bio-based packaging materials can be recycled, but for most new bio-based plastics recycling systems are not yet established.	1	1	4	4	2	41
15	Currently, only 0.016% of the global agricultural land is needed to produce renewable resources for bio-based plastics.	2	1	3	4	2	39
8	Bio-based packaging is suitable for many products such as dairy products, yoghurt, biscuits, beverages, ready meals and fresh products such as fruits and	1	2	5	3	1	37

	vegetables.						
12	Using bio-based feedstock such as wood, corn or sugar cane causes less CO_2 emissions and helps to keep fossil-based feedstocks such as crude oil in the ground.	2	2	3	3	2	37
21	Composting can be a good disposal option for some special applications if a collecting system for organic waste is in place. In general, recycling and energy recovery should be preferred.	1	1	7	2	1	37
13	Bio-based packaging materials contribute positively to the environment provided the biomass used in its production is cultivated and processed according to standards aimed at ending deforestation and protecting biodiversity, soil, water and air.	0	3	1	4	2	35
20	If a bio-based packaging material cannot be recycled, energy recovery through incineration or biogas production is the preferred option.	1	5	2	2.5	1.5	34.5
7	New and innovative bio-based packaging materials include bio-based plastics, starch- and cellulose-based products and composite materials.	2	2	5	2	1	34
6	Paper and cardboard are traditional bio-based packaging materials.	4	1	2	4	1	33
2	Bio-based packaging can help to avoid food waste by keeping perishable food such as lettuce or bread fresh longer compared to conventional packaging materials.	3	3	1	2	2	30
17	The best option for disposing bio-based packaging depends strongly on the application of the packaging material and the available waste infrastructure.	1	3	5	2	0	30
4	Some bio-based materials require fewer resources because thinner packaging can be applied.	6	1	1	2	2	29
1	Bio-based food packaging materials offer new properties which are advantageous for some applications (fruits, vegetables, salads) compared to fossil-based food packaging materials.	6	1	3	1	1	26
3	Bio-based materials can improve the taste of packaged fruits such as blueberries.	7	2	1	0	0	15

* The number corresponds to the original order in which the messages where presented, the order in the table reflects the overall score.
** Not all participants filled in an answer for each message.
*** The overall score is calculated by summing up all individual scores per message, e.g.: 0 votes * score 1 + 2*2 + 3*3 + 2*4 + 5*5 = 46.

Although not encouraged, some participants left a short comment to the messages:

- Message 1: ‘Check the source, if it is reliable, I read in the BioCannDo report that increase breathing’; ‘Not proven’; ‘Not proven as far as we know’
- Message 2: ‘Check source, no evidence’; ‘Not proven’; ‘Not proven as far as we know’
- Message 3: ‘Really?’; ‘Don’t believe it’; ‘Check reference not evident (durability of the taste); ‘Not proven’; ‘Not proven as far as we know’
- Message 4: ‘Difficult the strength is lower, then the possibility of reduce the thickness is difficult except the composites’; ‘Not proven’; ‘Not proven as far as we know’
- Message 6: ‘Add 2nd generation’
- Message 7: ‘Add corn-starch’; ‘insects…or other most innovative’

- Message 10: ‘Pose it as question’; ‘…environmentally friendly packaging, even if they are…’
- Message 11: ‘Cross our last sentence’
- Message 12: ‘If you move it’
- Message 13: ‘Simplify’; ‘Cross out everything after “contribute positively to the environment.”’; ‘consider entire life cycle’
- Message 15: ‘0,005%?’
- Message 18: ‘reused, recycled – terms must be understood’
- Message 20: ‘Too long, too heavy’
- Message 21: ‘Too long, too heavy’
- Message 22: ‘Too long, too heavy’; ‘Makes me think this generation of bio-based food packaging’

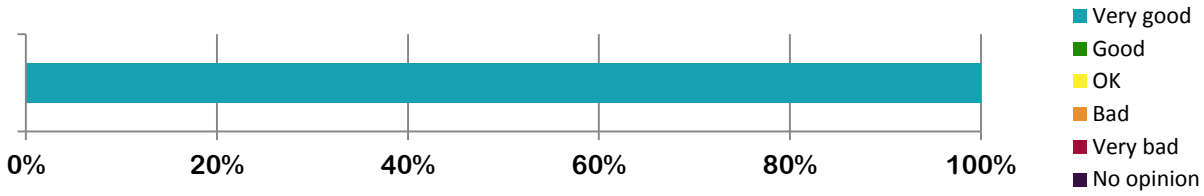
Annex 3 – Evaluation of the Product Expert Workshop

BioCannDo Stakeholder Workshop on Bio-Based Food Packaging
27 September 2018, Turin, Italy

Total number of participants: 14
Total number of feedback forms received: 10

Question 1) How do you rate the workshop in general? (n= 10)

Very good	10	Good	0	OK	0	Bad	0	Very bad	0	No opinion	0

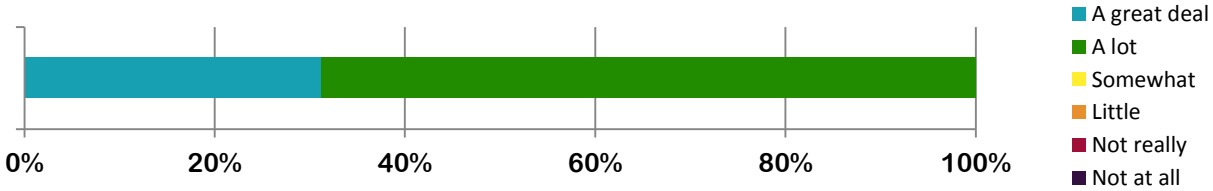


Comments:

- *Well arranged!*
- *I enjoyed the activities, the content was interesting and organisers were professional and nice.*

Question 2) Were you able to contribute to and participate in the discussion? (n = 10)

A great deal: 2.5	A lot: 5.5	Somewhat: 0	Not really: 0	Not at all: 0	No opinion: 0

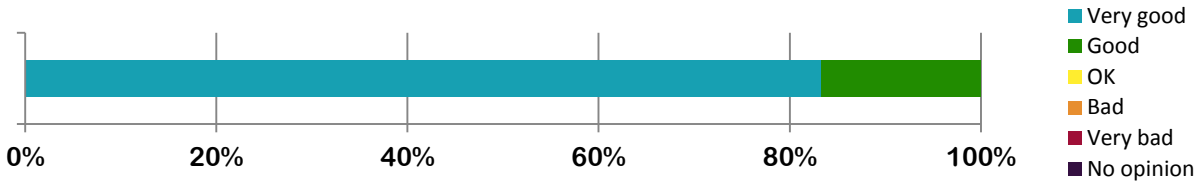


Comments:

- *It was open for all sorts of publics, this was a key of success.*

Question 3) Do you think we have a good breadth of perspectives in the workshop? (n = 10)

Very good: 7.5	Good: 1.5	OK: 0	Bad: 0	Very bad: 0	No opinion: 0

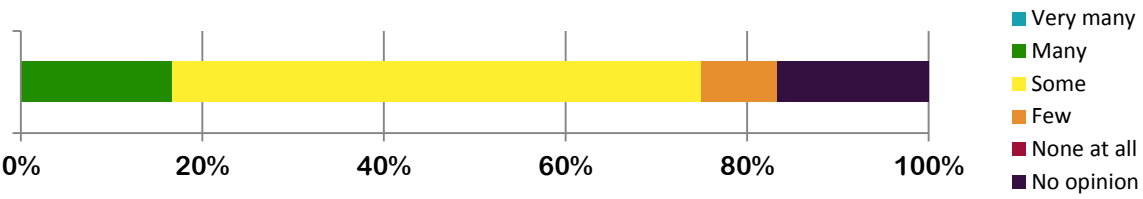


Comments:

None

Question 4) Did you make any new contacts during the workshop that are useful for your work? (n = 10)

Very many: 0	Many: 2	Some: 7	Few: 1	None at all: 0	No opinion: 0

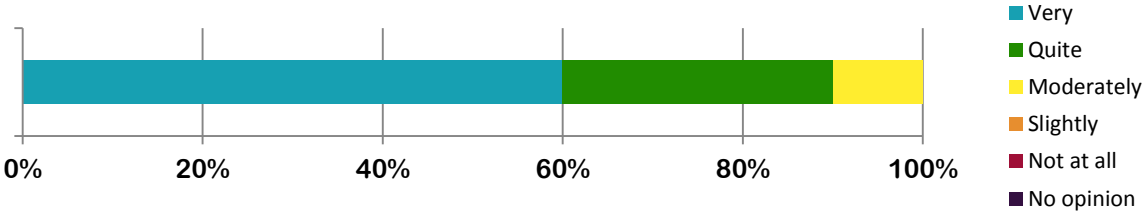


Comments:

- *Please share contacts.*

Question 5) In how far were the discussions in the workshop relevant to your work? (n = 10)

Very: 6	Quite: 3	Moderately: 1	Slightly: 0	Not at all: 0	No opinion: 1

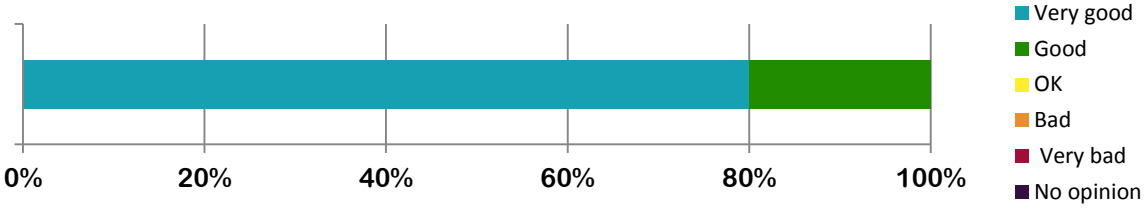


Comments:

- *None*

Question 6) How do you rate the process of the workshop? (n = 10)

Very good: 8	Good: 2	OK: 0	Bad: 0	Very bad: 0	No opinion: 0

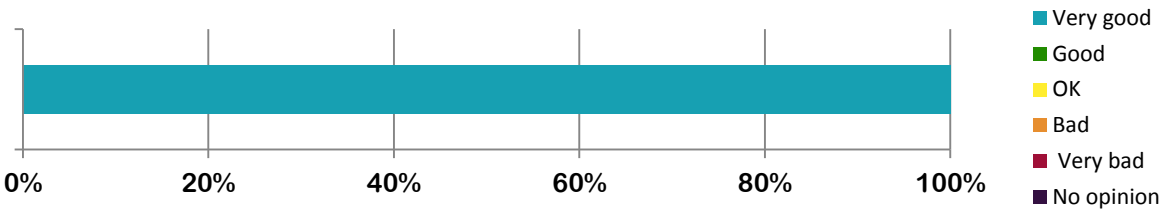


Comments:

None.

Question 7) How do you rate the work of the facilitators? (n = 10)

Very good: 10	Good: 0	OK: 0	Bad: 0	Very bad: 0	No opinion: 0

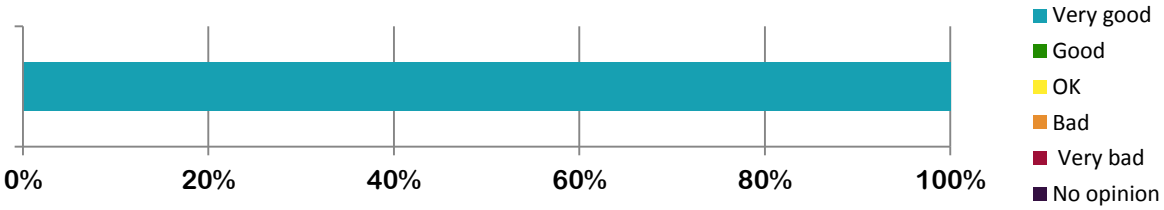


Comments:

- *Great team work, complementing each other, clear roles.*

Question 8) How do you rate the work of the project team? (n = 10)

Very good: 10	Good: 0	OK: 0	Bad: 0	Very bad: 0	No opinion: 0

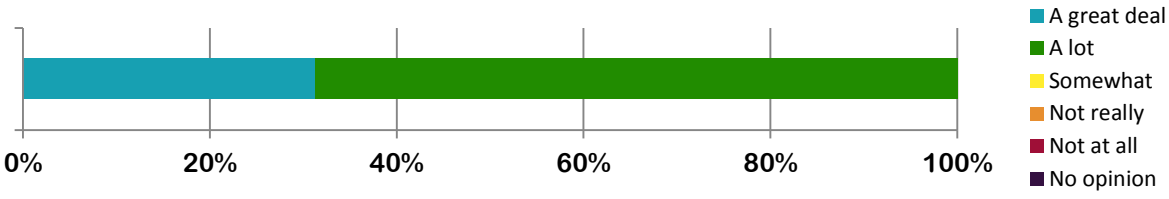


Comments:

None.

Question 9) How confident are you that your contributions and suggestions will be adequately taken up by the BioCannDo project? (n = 9)

A great deal: 2.5	A lot: 5.5	Somewhat: 0	Not really: 0	Not at all: 0	No opinion:

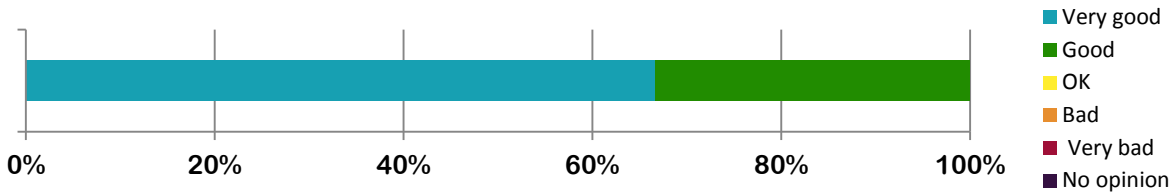


Comments:

None.

Question 10) How do you rate the practical arrangement (invitation, venue, catering)? (n= 9)

Very good: 7	Good: 2	OK: 0	Bad: 0	Very bad: 0	No opinion: 0



Comments:

None.

Question 11) Any further comments?

Please write:

- *Satisfied.*

Annex 4 – Focus Group Participant Profiles

Age			Gender		Profession
30 and below	31-50	51 and higher	Female	Male	
1	0	0	0	1	Student
1	0	0	1	0	Student
1	0	0	0	1	Student
1	0	0	0	1	Student
1	0	0	0	1	Student
1	0	0	0	1	Student
1	0	0	1	0	Student
1	0	0	1	0	Student
0	1	0	1	0	Employed
0	1	0	1	0	Employed
1	0	0	1	0	Neuropsychologist
1	0	0	1	0	Entrepreneur
0	1	0	0	1	Researcher
0	1	0	0	1	Freelancer
0	0	1	0	1	Unemployed
0	1	0	0	1	Writer
1	0	0	1	0	Student
1	0	0	0	1	Student
1	0	0	0	1	Student
0	1	0	1	0	Social worker
0	1	0	0	1	Unemployed
1	0	0	1	0	Master student
1	0	0	0	1	Student
1	0	0	1	0	Speech therapist

Annex 5 – Notes of the Focus Group

Focus Group 1, Trento, 9 Participants

Looking at the papers with examples of food packaging for coffee, milk and tomatoes.

Which product have you chosen in the past? Why?

- *Milk in pet carton because usually it's in discount, Coffee in foil packaging is the most available, I don't buy tomatoes because I have a vegetables garden*
- *Plastic bottle instead of glass bottle, because there is long-term product, Coffee in foil because we drink a lot of coffee and the quantity of the packaging is enough for us. Tomatoes in plastic box because the taste is better than others and they are more comfortable*
- *Milk in pet carton because I prefer it, Coffee in foil packaging because I can easily throw away the packaging, tomatoes without packaging*
- *Milk in plastic bottle even if I don't really like milk, I don't buy it often; Coffee in foil packaging because of the taste and Tomatoes without packaging to be more ecologic*
- *Milk in plastic bottle because it's a long-term product, coffee in foil packaging because I can preserve it for a long period.*
- *Milk in pet carton because it can be reserved for a long period when I am alone, when I'm with my family I usually prefer plastic bottle. Coffee in foil packaging because it's a family custom, tomatoes in plastic box are better because of the quantity but If there will be discount I will probably change*
- *Milk in pet carton because it's more comfortable, coffee in foil packaging because usually it's in discount, tomatoes in paper bag but I don't eat tomatoes often*
- *Milk in pet carton because it's a long-term and comfortable packaging, coffee in foil packaging because it's a family custom, I don't usually buy tomatoes at the supermarket*
- *Milk in pet carton is more common and comfortable, coffee in foil packaging because often it's in discount, tomatoes in plastic box are faster to be used.*

The moderator explains the aim of the BioCannDo project.

What do you expect from a bio-based food packaging material?

- *Price (more expensive)*
- *Less pollution*
- *Sustainable production*
- *Lack of information and knowledge*
- *Characteristic (more information than usual)*
- *Food behavior and traditions (how to promote new products with a new bio-based packaging)*
- *Availability*

The moderator lays out the key concepts previously developed by the project.

Which of these points would be the most important in relation to bio-based food packaging materials? (3 votes for person)

- *Price (more expensive)*
- *CO2 emissions*
- *Healthy and safety*
- *Availability*
- *Better taste of the food*
- *Better functionality*
- *Research and Innovation*
- *Recycle*
- *Displace*
- *Raw materials renewable*

Comments:

- *It's essential give more information to the consumers and try to explain characteristic concerning their health and safety*

_____

Focus Group 2, Trento, 10 Participants

Which product have you chosen in the past? Why?

- *Milk in plastic because plastic bottle is more renewable than glass bottle, coffee in foil packaging preserves better the taste of the coffee, Tomatoes in paper bag because I think they are healthier than the others.*
- *Milk in plastic is a long-term food instead of milk in glass bottle, I prefer Coffee in metal can because of the packaging and the taste of the coffee, Tomatoes in plastic package are more comfort and available*
- *Milk in pet carton and coffee foil because my family used to buy this kind of product, we have vegetables garden, so I don't use and buy any packaging*
- *Milk in bio-based packaging because the packaging is more comfortable, Coffee in bio-based capsules because I don't have to add additional ingredients. Tomatoes in paper box is better for the taste of the food*
- *Milk in pec carton because it's a family custom, my favorite coffee brand uses only coffee in foil packaging, the tomatoes plastic box is more comfortable when you don't have too much time for cooking or shopping*
- *I buy bio-based food packaging for coffee and milk because is environmentally friendly and biologic. I usually prefer tomatoes without packaging*
- *Milk in plastic bottle because it's easier to be carried. I don't buy coffee and I prefer tomatoes without packaging*
- *-Milk in plastic bottle because in the supermarket there are too many options, Coffee in foil packaging is the most commercial. I prefer tomatoes in can because I don't like fresh vegetables.*
- *Milk in pec carton because the supermarket close to my house has only this kind of packaging. My family and I prefer to buy only tomatoes in can*
- *Milk in pec carton because it's the only available in my village, Coffee in foil because it's renewable, tomatoes in plastic box have better taste than the others. During the summer I usually don't buy vegetables because I have my personal vegetables garden.*

The moderator explains the aim of the BioCannDo project.

What do you expect from a bio-based food packaging material?

- *More fragile*
- *Biodegradability*
- *Environmentally friendly*
- *Costs of production*
- *Price*
- *Renewable*
- *Food safety*
- *Availability*
- *Design*
- *Quality*
- *Ethics*
- *Fair Trade*

The moderator lays out the key concepts previously developed by the project.

Which of these points would be the most important in relation to bio-based food packaging materials? (3 votes for person)

- *Less CO_2 emissions*
- *Disposal*
- *Better taste of the food*
- *Better functionality*
- *Less raw materials*
- *Food edibility*
- *Agricultural Derivates as raw materials*
- *Research and innovation*
- *Recycle*
- *Raw materials renewable*
- *Less packaging*
- *Environmentally friendly*
- *Pet friendly*
- *Healthy and safety*
- *Price*
- *Can be used with many products*
- *Aesthetics*
- *Ethics*

Comments:

- *It is necessary give more attention to the philosophy of the products (design, fair trade and ethics). If you need to attract more customers, you should design an organic packaging with specific colors, logo and description. In addition, it's needed sell biologic food/ fair trade foods or zero-kilo foods in this kind of packaging otherwise you will never reach a wide number of buyers.*

_____

Focus Group 3, Trento, 5 Participants

Which product have you chosen in the past? Why?

- *Milk in pet carton for a long-term storage, Coffee foil because I use only the moka; I have the vegetables garden so rarely I used to buy tomatoes but when happens I prefer the plastic package*
- *I prefer milk with bio-based packaging. Usually I buy coffee in the glass bottle. I really hate tomatoes but when I eat I prefer the plastic package because the packaging is waterproof*
- *Milk in pet carton, Coffee Foil because it is the most common, Tomatoes in plastic package because it is the most available at the supermarket and I can find the kind of tomato that I love it with this packaging*
- *Milk in pet carton, Coffee Foil because I have a specific glass recipient. Tomatoes in plastic package because the taste is better*
- *Milk in pet carton because it's really convenient, price and quality. Coffee foil because my family have this habit. Tomatoes with paper bag but I have a vegetables garden so I don't buy vegetables at the supermarket or with packaging.*

- *The moderator explains the aim of the BioCannDo project.*

What do you expect from a bio-based food packaging material?

- *More expensive*
- *Biologic*
- *More healthy*
- *Environmentally friendly*
- *Availability*
- *More fragile*
- *Faire Trade*
- *Ethics*
- *Better taste of the food*
- *High costs of production*
- *Better design*

The moderator lays out the key concepts previously developed by the project.

Which of these points would be the most important in relation to bio-based food packaging materials? (3 votes for person)

- *Price*
- *Environmentally friendly*
- *Ethics*
- *Better taste of the food*
- *Healthy and safety*
- *Availability*
- *Less CO_2 emissions*
- *Fair Trade*
- *Research and Innovation*
- *Better functionality*
- *Less raw material / efficient production*

Comments:

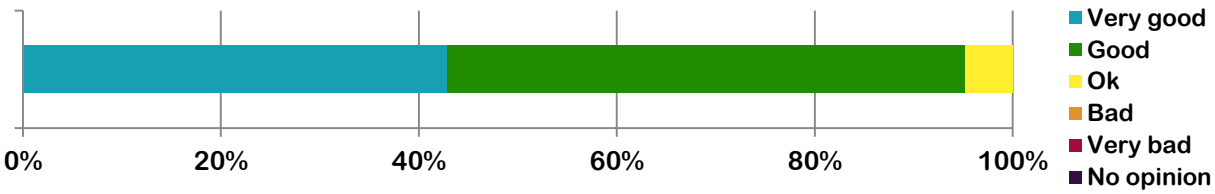
- *We should produce materials and products available to all costumers*
- *We should promote fair trade foods.*

Annex 6 –Evaluation of the Focus Group

Evaluation BioCannDo consumer focus group organised by Prospex.

Question 1) How do you rate the consumer focus group? (n= 24)

Very good	9	Good	11	OK	1	Bad	0	Very bad	0	No opinion	0

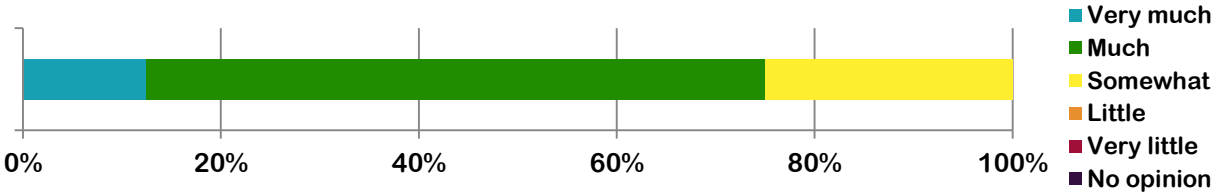


Comments:

- *Too many participants, it not always easy have a discussion*

Question 2) Were you able to contribute to and participate in the discussion? (n = 24)

Very much: 3	Much: 15	Somewhat: 6	Little: 0	Never: 0	No opinion: 0

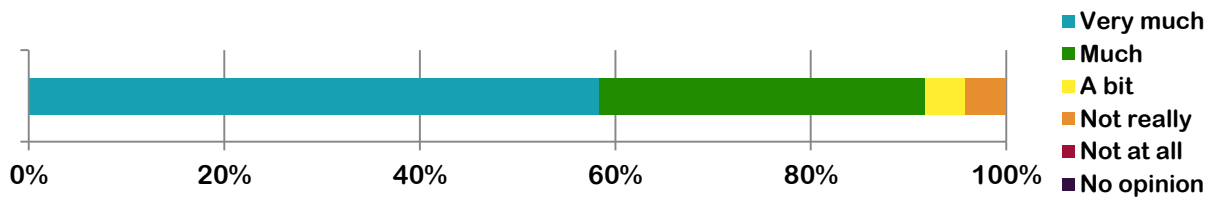


Comments:

- *Maybe the language has been a problem for me, but I spoke in English*
- *More than I thought, very good way to conduct the group*

Question 3) Did you learn something new during the focus group? (n = 24)

Very much: 14	Much: 8	A bit :1	Not really: 1	Not at all: 0	No opinion: 0

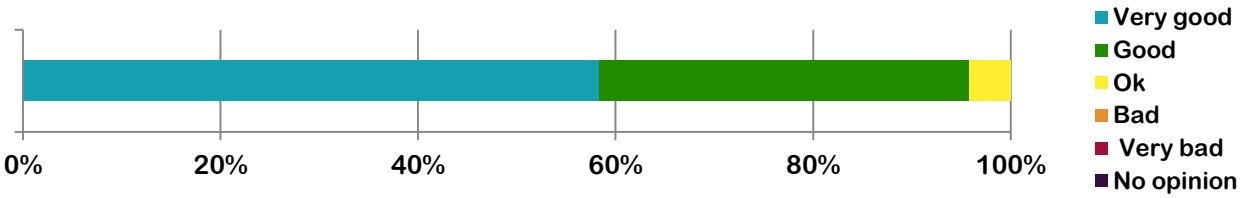


Comments:

- *Yes, I didn't know about this topic*

Question 4) Are you satisfied with the organization and communication? (n = 24)

Very satisfied: 14	Satisfied: 9	Somewhat: 1	Not satisfied: 0	Very unsatisfied: 0	No opinion: 0



Comments:

None.

Question 5) Any other comments?

- *You should choose participants more interested*
- *Don't give up the project*
- *You should try to have a better list of attendance without empty chairs*
- *I would like to have more time to discuss about it*
- *I would like to read the results about other countries*
- *I would like to receive more materials, links, and suggestions in order to look into the topic*
- *There are too many clusters*
- *Italian translation of Biocanndo flyers*