



What should be the future of plant-based food chains using agrobiodiversity?

Citizen-consumers contributed to decide it!

In the frame of the European project DIVINFOOD¹, a large online survey and several workshops have been organised in 2022 in 7 countries (Denmark, France, Hungary, Italy, Portugal, Sweden, Switzerland) to collect citizen-consumers' opinions regarding the development of plant-based food chains in relation to environmental issues. In DIVINFOOD, consumers are also seen as citizens, who can not only decide what is on their plate but also what should be implemented in supply chains that produce and deliver food. Especially, in a context of biodiversity decline, the survey and the workshops aimed at designing how, according to citizen-consumers, agrobiodiversity² should be used in food supply chains, from plant varieties selection to plant-based food marketing. These opinions will guide the research and innovation activities developed in the DIVINFOOD project and, more largely, will be a source of recommendations for policy-makers, professionals, as well as for NGOs, consumer and citizen organisations concerned by the biodiversity decline and/or the development of food chains.

Information about food chains and options of agrobiodiversity use was given to participants to favour a good understanding of the questions asked. About 2 400 contributions were received from the online survey, and the workshops gathered about 100 participants. Despite certain categories of gender, age, socio-economic groups and living areas being slightly over-represented, the collected answers reflect a large diversity of individuals from 4 regions in Europe (North, South, West, Central Europe). The DIVINFOOD team is very grateful to all these contributors, and stresses that the DIVINFOOD project is open all interested actors who wish to participate. We present the key results below, and their implications for research, innovations and policies.

¹ "Co-constructing interactive short and mid-tier food chains to value agrobiodiversity in healthy plant-based food". This project is financially supported by the European Commission's Horizon 2020 research and innovation program, under the approval number 101000383. It involves researchers, farmer organisations, small-scale food businesses, agricultural and rural development organisms, technical institutes, consumer associations, restaurant associations, local authorities, and open source developers. For more information, see the website: <https://divinfood.eu>

² Agrobiodiversity is the part of biodiversity that is a resource for agricultural production. It includes all plant species and varieties used to produce food.

A common concern regarding biodiversity, however not driving food habits

The disappearance of certain plant or animal species, which is part of the decline of agrobiodiversity, appeared as an important concern of the respondents: of seven problems related to environmental degradation, it has been cited by 41% of the respondents (out of a total of 2 375 answers) as their first or second choice, after the climate change (cited by 71%) and the pollution of water, lakes and rivers (43%). Moreover, supporting food production that contributes to the preservation of neglected and underutilised varieties has been cited by 31% of respondents (out of a total of 1 724 answers) as their first, second or third choice, among 10 impacts. Taking into account all the responses, this impact is thus ranked 4th, after the contribution to consumer health, the positive impact on climate and the contribution to rural development.

However, only less than 20% of respondents declared to choose a food product in relation to the plant varieties or animal breeds it comes from. The presentation of a picture of a package of flour made from ancient varieties of wheat confirmed that respondents are not much interested by the varieties from which the flour has been made. In addition, it was difficult for most respondents to detail the species and varieties of plants present in the last dish they had eaten.

Widely shared preferences regarding the use of agrobiodiversity in food chains, except in matters of information

Respondents to the online survey and participants in the workshops were asked to evaluate different options for the use of agrobiodiversity in food chains, using a scale ranging from 'excellent' to 'bad' or 'reject'. For each stage of the value chain, respondents were asked not to choose but to evaluate both the 'conventional' option, which is the most commonly implemented in food chains, and another, 'alternative' option.

More than 80% of respondents judged positively producing food from locally selected and/or traditional plant varieties, by organic labelled production methods and minimal processing techniques, as well as selling food by farmers or small-scale processors from their region - all being options considered as alternative. On the other hand, only about 40% judged positively conventional options commonly implemented in food chains, like producing food from new varieties or selling food in supermarkets. In addition, there was no consensus on how information on plant species used in food should be provided. In particular, the use of digital applications to provide information, seen as an alternative to presenting information on packaging, received very mixed evaluations.

In the online survey, evaluation scores appeared not to be dependent of the socio-economic group, the education level and the area of residence (urban/rural) of the respondent. Without questioning the mostly positive opinions regarding alternative options, evaluations appeared more influenced by the age and the country:

- young respondents and respondents from Portugal were more positive than the others to both conventional and alternative options to use agrobiodiversity in food,
- older respondents and respondents from Denmark and Hungary were less positive than the others about alternative options,

- respondents from France were more positive than the others about these alternative options.

The workshops gave the opportunity to further discuss options of agrobiodiversity use in food chains, targeting the under-utilised plant species that are the focus of the DIVINFOOD project and that are still little used in Europe for food production (minor cereals as, for example einkorn, and legumes). As in the survey, participants judged positively the alternative options of agrobiodiversity use in food chains. However, they explained that the conventional options are also interesting for specific groups (students, “average” urban consumers) or, precisely, to increase the use of underutilised plant species in food chains. Discussions highlighted more largely the risk to develop elitist and time-consuming chains for consumers, also calling for taking in consideration these constraints in short chains. In all cases, participants want to be informed about what is done in food chains, but expressed different expectations regarding information type and tools, with, in some cases, an aversion to the use of digital applications. Moreover, in the case in which the plant species is hardly known and consumed, participants said they first want to know better its added values, particularly in the health/nutrition point of view.

Implications for research, innovation and policies

The DIVINFOOD European research and innovation project aims to develop food supply chains valuing neglected and underutilised agrobiodiversity, for and with citizen-consumers, by focusing on minor cereals and legumes whose use for human food in Europe is low. Beyond the slight nuances between age groups and countries, most of the alternative options to use agrobiodiversity (on which DIVINFOOD planned to focus) were evaluated positively by a large majority of respondents, both in the online survey and in workshops, whatever their socio-economic group, level of education or area of residence. Research, innovations and policies on food chains have thus to strengthen their support towards the selection of local/traditional seeds, organic labelled production methods, minimal processing techniques and short food chains.

The discussion on marketing channels in the workshops nevertheless highlighted the interest in developing not only short chains but also "mid-tier" chains. These chains offer products in relatively large quantities, which are well identified and of better quality than mass-produced products, and which can be found in conventional shops. An example of a mid-tier chain is a chain offering regional products based on quality specifications and sold in supermarkets. Working on these chains is planned in DIVINFOOD but was not clearly suggested in the survey. DIVINFOOD partners, and all concerned actors, thus have to highlight and/or strengthen their contribution to the development of mid-tier chains.

However, the use of agrobiodiversity in both short and mid-tier chains requires a broad evaluation of its impacts, to ensure meeting the various concerns of consumers. Taking in account consumer-citizens' opinions, there is an opportunity in DIVINFOOD (and other research projects), to highlight, from data produced with local actors, that supporting agrobiodiversity-based production can also contribute to consumer health, climate change mitigation, and rural development.

Moreover, information on agrobiodiversity use in food products remains a key issue which calls for more discussions and co-design with citizen-consumers. Mentioning the species/varieties on the package appeared inefficient. The DIVINFOOD project has therefore to seek a better way to provide information about food products valuing neglected and underutilised agrobiodiversity. In terms of information content, the discussions in workshops highlighted the importance to present the impacts of using agrobiodiversity in food (e.g. contribution of using legumes to produce healthy food), and not only the use of agrobiodiversity.

In a general context of declining biodiversity, it is essential to increase the use of agrobiodiversity, which is neglected and could disappear. According to the online survey, the most favourable channels for the consumption of new species are farmers' markets and restaurants. Therefore, collaboration with these markets as well as with chefs around agrobiodiversity-based food and recipes (as planned in DIVINFOOD) should really be the subject of specific efforts in policy, innovation and research programmes.

Next steps

The results of this consultation of citizen-consumers are disseminated from January 2023 to respondents as well as to institutional and socio-economic actors (policy-makers, actors of food chains, NGOs...). Their full integration into DIVINFOOD's activities is in progress. To go beyond the consultation, and involve them in the decisions of the project, the DIVINFOOD team invite citizen-consumers to follow and comment the project's different phases and developments, as well as to take part in its activities (participatory breeding of plant varieties, food tastings, co-design of information tools, etc.).

Contacts

To subscribe to the DIVINFOOD newsletter (in English, Danish, French, German, Hungarian, Portuguese or Swedish), follow and comment on project activities, use the following link: <https://divinfood.eu/news-events/>

To access the full results report (in English): <https://zenodo.org/record/7459517#.Y7c2NtWZM2w> (open access)