"Estimating the effects of an agricultural producer subsidy on the availability and accessibility of fruit, vegetables and pulses in France"

A study commissioned by the European Public Health Alliance (EPHA)

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Abstract

This study modelled the responsiveness of small-scale farmers in France to two types of producer subsidies available under the Common Agricultural Policy (CAP): the small farmers scheme and voluntary coupled support. The potential impacts of subsidies on production and consumption were estimated for three product categories: fruit, vegetables, and pulses. Four scenarios with different levels of financial incentives were used for each of the two schemes. The total social cost of each intervention was estimated. The impacts were presented in light of recommended levels of consumption in national dietary guidelines.

Both voluntary coupled payments and the small farmers' scheme, showed a **positive correlation between subsidy increase and agriculture production growth**. The strongest scenario with a subsidy of 4.000 €/ha for farms below 10 ha was shown to fill more than 40% of the gap between the current situation and what would be required to fulfill the nutritional requirements for vegetables from national production. The consequent impact on consumption (assessed as availability of food for consumption) from a production subsidy is particularly significant for vegetables, while for pulses consumption it remains low.

Product-based subsidies can make an important contribution to increasing the supply of food products recommended in national dietary guidelines. Significant impacts on consumption are observed on products that are already largely consumed (vegetables) and that are not concerned by competing interests for their utilization (such as feed for pulses).

Production support measures need to be combined with interventions aimed at balancing feed and food supply and market for pulses. Furthermore, beyond production measures for fruits and vegetables, other parallel supply chain and demand-creation interventions can be envisaged for small farmers, such as public procurement and local markets. **Producer subsidies for small-scale farmers can alter dynamics in supply chains, improve their position and bargaining power, and create new opportunities for value addition**.

[1] This study was prepared in March and April 2021.

Background

In the context of post-2020 renewal of the European Union (EU) Common Agricultural Policy (CAP), each Member-State has to prepare a "CAP Strategic Plan". According to this plan, every country has to identify, among others, its needs in relation to CAP objectives, and promote a cohesive intervention plan in order to meet these needs. A key goal that will need to be considered by member states is to provide "food and health, including safe, nutritious and sustainable food". In France, this goal is confronted with two crucial challenges: the need to fulfil the nutritional requirements and guidelines of the 4th Programme National Nutrition Santé 2021-2023 (PNNS4) (Ministère des Solidarités et de la Santé, 2019); the importance of supporting small-scale farms for the production of healthy and under-consumed and under-produced foods such as fruits, vegetables and pulses[2].

Objectives

The aim of the present study is threefold. Firstly, it aims to provide a quantitative overview of production and consumption levels of fruit, vegetables and pulses in France and to relate those levels to current nutritional recommendations and potential self-sufficiency performance at a national scale. Secondly, it aims to provide an analysis of small-scale farmers' responsiveness on different policy incentives towards the increase of the supply of pulses, and fruits and vegetables, by modeling and evaluating the potential impact of subsidies on production capacity of small-scale producers. Thirdly, it aims to show how this increase on the supply may affect the national consumption of the examined products, by modeling and depicting consumption dynamics that are potentially induced by increased internal supply of fruits, vegetables and legumes. In the end, this study also analyzes the value chain functioning and reaction under increased supply of fruit, vegetables and pulses, to explore market opportunities, barriers and lock-ins for the access and profitability of small-scale producers.

Methodology

At a first step, data of production and consumption of fruits, vegetables and pulses in France were retrieved from FAO, FADN and Agreste databases, in order to identify national production and consumption levels as well as the extent of correlation with the nutritional levels of intake recommended by the PNNS4[3]. These data have been analyzed via standard statistical methods in order to identify the potential imbalance between supply and demand under the hypothesis of self-sufficiency for France with regards to the studied products.

[2] The FAO definition of pulses is provided in the Annex Metadata.
[3] The nutritional recommendations of PNNS4 that are used for calculation are provided in the Annex Metadata.

At a second step, for the assessment of potential impact of subsidies on small-scale producers of fruits, vegetables and pulses, a general equilibrium model (Dervis et al., 1982) was applied to assess the expected responsiveness by producers to product-based subsidies, aiming to increase the supply of the examined products. We have therefore examined small-scale producers' responsiveness towards the possible implementation of product-based subsidies. To model the responses of French farmers to different levels of incentives on fruits, vegetables, and pulses, as well as the impacts of the possible supply variations of the later products on the national consumption, a standard computable general equilibrium (CGE) model has been developed (Dervis et al., 1982; OECD, 2016). The necessary data, as well as the national Social Accounting Matrix (SAM) for the calibration and the simulation of the different scenarios, have been extracted from the Agreste database. The model has been developed by the use of the General Algebraic Modeling System (GAMS) software, and solved using the MCP solver (Brooke et al., 2011).

In order to simulate production and consumption responses in different levels of incentives, two sets of different scenarios were designed. The first set assesses the effect of different increases on the **Small Farmers' Scheme** (for small farms ≤ 10 ha and small farms ≤ 20 ha) towards the adoption of fruits, vegetables, and pulses, while the second set examines different levels of **Voluntary Coupled Payments**, potentially for all farms. In the following table, we present the two sets of scenarios.

Small Farmer Scheme	
Scenarios	**Value of incentive per farm (in €)**
Scenario 1	3000
Scenario 2	4000
Scenario 3	5000
Scenario 4 / Strong innovative	**7000**
Voluntary Coupled Payments	
Scenarios	**Value of incentive per hectare (in €)**
Scenario 1	1000
Scenario 2	2000
Scenario 3	3000
Scenario 4	**4000**

Table 1 Scenario characteristics

In general, the current levels of small farm schemes seem not efficient enough in order to attract high levels of farmers' participation, while the majority of the Voluntary Coupled Payments attract mostly the livestock production systems (e.g. Jansson et al., 2018). According to the study of Lécole et al. (2020), higher values of small farm schemes should be proposed in order to attract a higher rate of farmers' participation. Hence, following this previous study,

we have designed and assessed four different scenarios with higher values of small farm schemes.

In order to further examine the ability of other policy implementations to mobilize small-scale farmers to change their production systems to fruits, vegetables and pulses, we have designed and assessed four different scenarios with higher values of Voluntary Coupled Payments. However, here we have to note that a strong debate about the future of these payments exists nowadays in the European Commission with many Member-States proposing to replace them with decoupled payments.

Finally, apart from the several data and methodological limitations of our modeling attempt, the analysis of the impacts of an increasing supply of goods on the consumption is a complex subject which demands the analysis of the socio-economic and socio-cultural aspects of consumers, however, this is out of the scope of this study.

Results

Assessment of national production and consumption of fruits, vegetables and pulses

In this section, levels of production and consumption of fruits, vegetables and pulses – only for human consumption - are assessed at a national scale and then compared to the nutritional guidelines of PNNS4. The aggregate calculation of production and consumption is associated to the assessment of the quantities of fruits, vegetables and pulses that would need to be consumed to meet the national dietary guidelines. In the perspective of self-sufficiency of France (i.e. considering only national production as global supply) for fruits, vegetables and pulses, and in view of achieving the national dietary guidelines for the same products, the data show that national production of fruits, vegetables and pulses is not sufficient to feed French population (data are displayed in tables 2 and 3).

	PRODUCTION	IMPORT	EXPORT	**FOOD AVAILABILITY FOR CONSUMPTION**	**GUIDELINES PNNS (consumption)**
FRUITS	**2558***	3463*	1042*	**5546****	**4744**
VEGETABLES	**5894***	2318*	1070*	**6629****	**7116**
PULSES	**387***	73*	---	**151***	**678**
Other pulses	*55**	*67**	*17**	*108**	---

Table 2 Food balance and nutritional guidelines in France for fruits, vegetables and pulses (data retrieved from Agreste and FAO** databases, 2018; **1000 Tons/year**).*

In table 2, the food balance of the food group "Other pulses" (mainly represented by lentils, 80%, and beans, 20%) is also considered as it represents 70% of the pulses consumed in France. In addition, with regards to the food group "Other pulses", specific data (from Agreste) of production, import, export and consumption are available and take into account the

distinction of utilization of these products, specifically with regards to seed and feed utilizations. Instead, while for the general group "Pulses" the quantities used for feed are assessed for all the exchanges (production, import, export, consumption), the quantities used for seed are not assessed for the export. For this reason, it is not possible to estimate the value of pulses for human consumption that are exported.

	FOOD AVAILABILITY FOR CONSUMPTION	GUIDELINES PNNS (consumption)
FRUITS	82,86**	73
VEGETABLES	99,05**	109,5
PULSES	2,3*	10,43

Table 3 Consumption and nutritional guidelines in France for fruits, vegetables and pulses (data retrieved from Agreste and FAO** databases, 2018; **Kg/capita/year**).*

Food Balance data gathering – Methodological insights

In table 2, the food balance of fruits, vegetables and pulses in France are reported according to year 2018 FAO and Agreste data. These data are at the moment the most recent ones that allow to assess - and compare - production, import, export and food availability for consumption in France for the food products studied. With regards to consumption, the most recent data that are available - and that can be therefore correlated to production, import and export data - are retrieved to inform a proxy indicator of consumption from an aggregate indicator of **food availability destined to consumption**. In particular, fruits and vegetables availability destined to consumption is assessed according to data from FAOSTAT database through the FAO indicator "Food". The "Food" FAOSTAT indicator (used as a proxy of food consumption) is calculated by deducting, from production plus import of a product, the values of export, losses, seeds, feed, stocks, processed food, tourist food, non-food uses, and residuals. It is also acknowledged that these data assessments bring with them a significant degree of approximation. Also, a comparative analysis of FAO data of food availability destined to consumption with survey-based consumption data from INCA 3 (2014-2015, Étude individuelle nationale des consommations alimentaires 3, ANSES 2017), and from Eurostat on frequency of consumption (2017), show different levels of fruits and vegetables consumption, but still being in the same order of magnitude. In fact, the FAOSTAT "Food" indicator for fruits and vegetables (i.e. availability for consumption), which is taken as a proxy for consumption, would show higher levels than the consumption measured through surveys by INCA 3 and Eurostat. For instance, in France for year 2014, the "Food" FAOSTAT indicator of availability for consumption was assessed to 219,8 and 259,6 g/capita/day, while the INCA 3 surveys on consumption measured respectively 129,9 and 130,7 g/capita/day. Therefore, it is possible to observe that food balance values from FAOSTAT tend to overestimate food consumption of fruits and vegetables. However, the most recent and comparable FAOSTAT data are available for 2018, while the most recent

ones from INCA 3 data are available for 2014 and the newest frequency measures from Eurostat are for 2017.

Figure 1 clearly illustrates the gaps in national production for fruits, vegetables, and pulses in France that should be increased to 85%, 20% and 75% respectively, to meet nutritional requirements on the basis of an in-country production. Beside the increase needed for the general group of pulses, Figure 2 displays the hypothetical quantities needed to reach the nutritional guidelines if this gap had to be filled only with "Other pulses" production (mainly lentils and beans). With regards to consumption, Figure 3 shows the potential of consumption (assessed as availability of food for consumption) increase needed to reach the nutritional guidelines for vegetables and pulses. It is observed that pulses are consumed to a very low extent: in order to meet the nutritional requirements, pulses consumption in France should be at least 3,5 times higher (>350%), and vegetables consumption should increase to 7%. Fruit consumption is not displayed in figure 2 since aggregate data for fruits show that consumption levels (assessed as availability of food for consumption) largely exceed the nutritional requirements. However, survey-based data from Eurostat on frequency of fruit consumption in French population indicates that there are differences among groups, including differences based on household characteristics, social and economic status (as previously observed by De Saint Pol, 2008, Régnier et al., 2009, Marie et al., 2018).

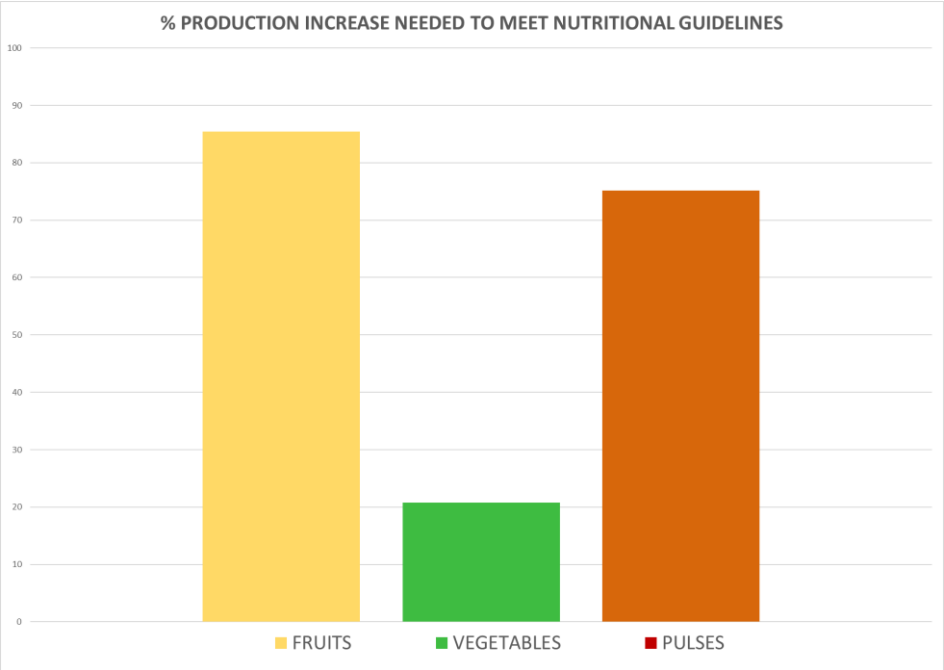

Figure 1 Percentage increase of production that is necessary to meet national nutritional guidelines for fruits and vegetables (2018).

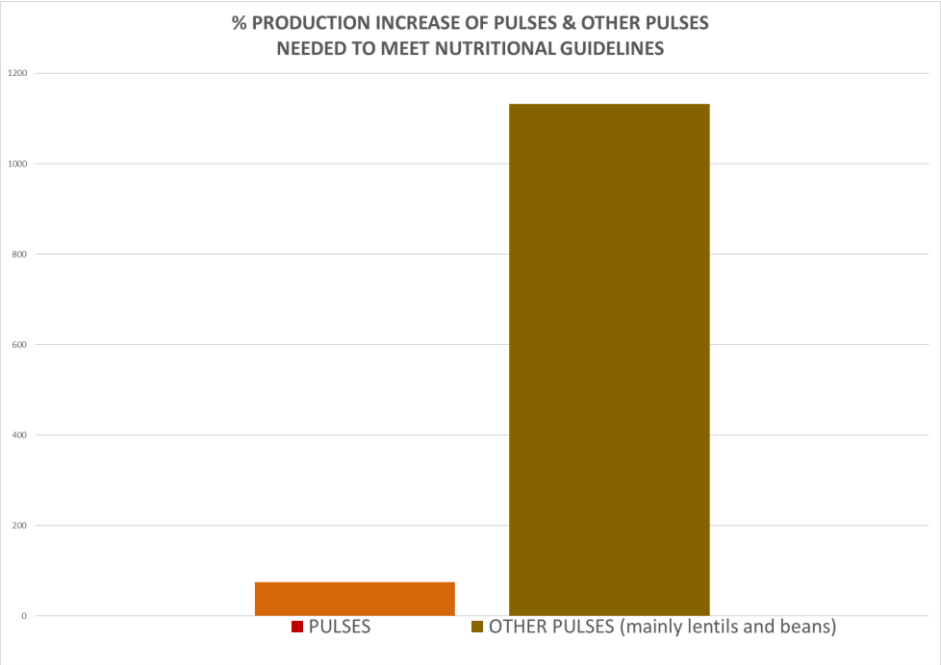

Figure 2 Percentage increase of production that is necessary to meet national nutritional guidelines for Pulses and Other pulses (2018).

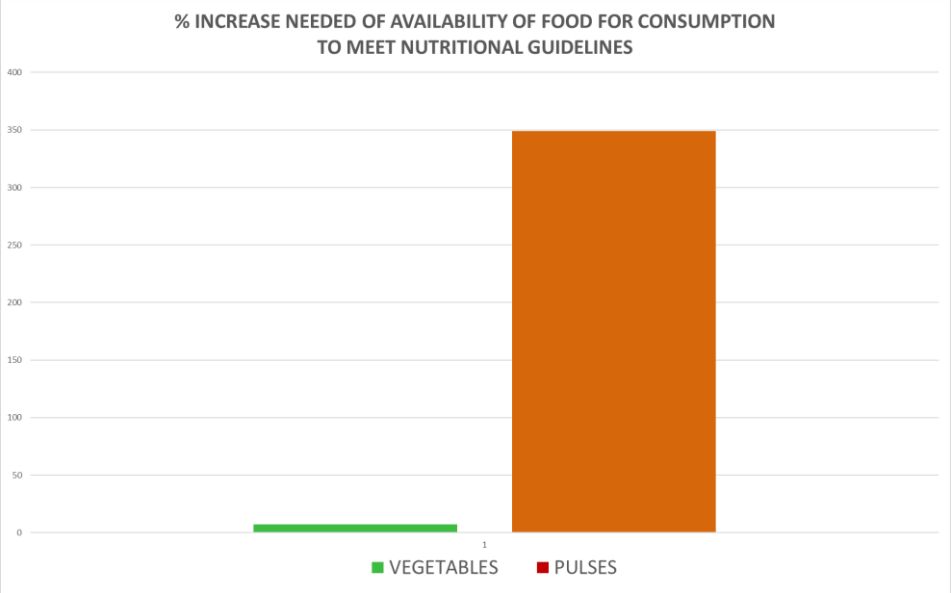

Figure 3 Percentage increase of consumption that is necessary to meet national nutritional guidelines for vegetables and pulses (2018).

Small farms' production and general consumption responsiveness to product-based subsidies in different scenarios

According to the methodology presented above, we have designed four different schemes of subsidies for two groups of small farms in France, i.e. small farms ≤ 10 ha and small farms ≤

20 ha. The four schemes consist of payments for 3000 € (scenario 1), 4000 € (scenario 2), 5000 € (scenario 3) and 7000 € (scenario 4 / strong innovative) per hectare.

For each subsidy scenario we have assessed the responsiveness of farms in terms of production as it is illustrated in figure 4 and 5. These scenarios are tested for the food groups "fruits" and "vegetables" as data on human consumption products (assessed as availability of food for consumption) are available for both groups with regards to production, consumption, import and export (table 2). As explained above, these data are not totally available for the "Pulses" group, while they are available for the "Other pulses" group. For this reason, and since the "Other pulses" food group has an important contribution in the whole consumption of pulses in France, the scenario simulation was developed building on data available for the group 'Other pulses" and not for the group "Pulses". With regards to production, both figures display a positive correlation between the financial amount of subsidies and the increase of production for fruits, vegetables and other pulses in both small farms' groups (≤ 10 ha and ≤ 20 ha).

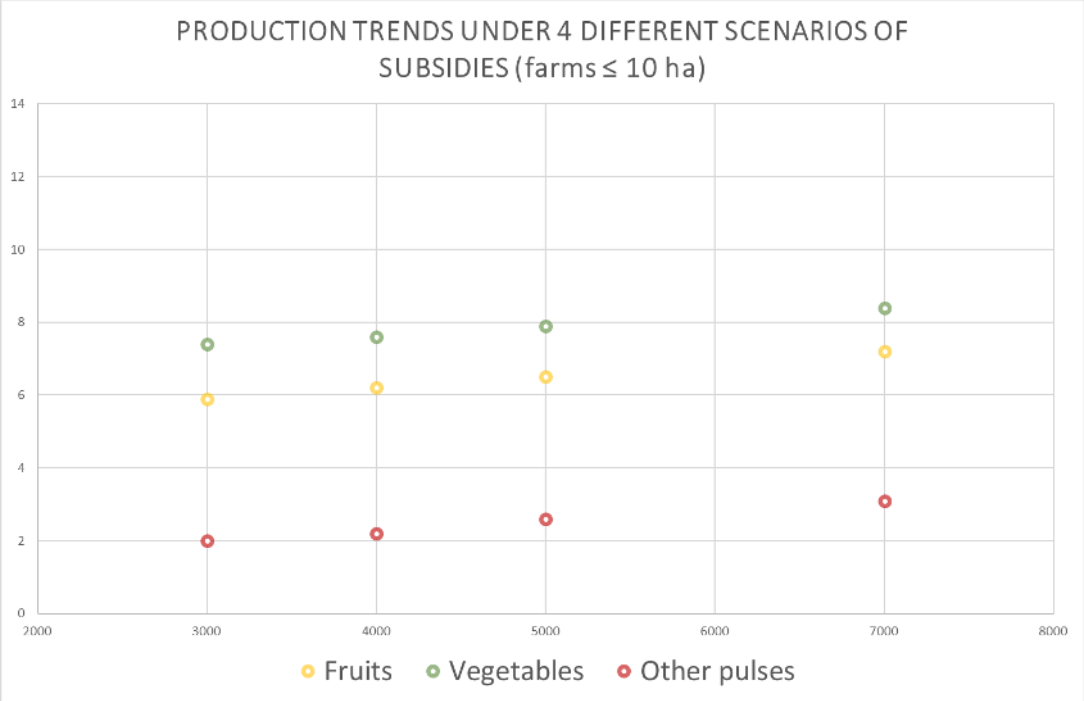

Figure 4 Percentage of production increase under different payment scenarios (3000 €, 4000 €, 5000 €, 7000 €; farms ≤ 10 ha)

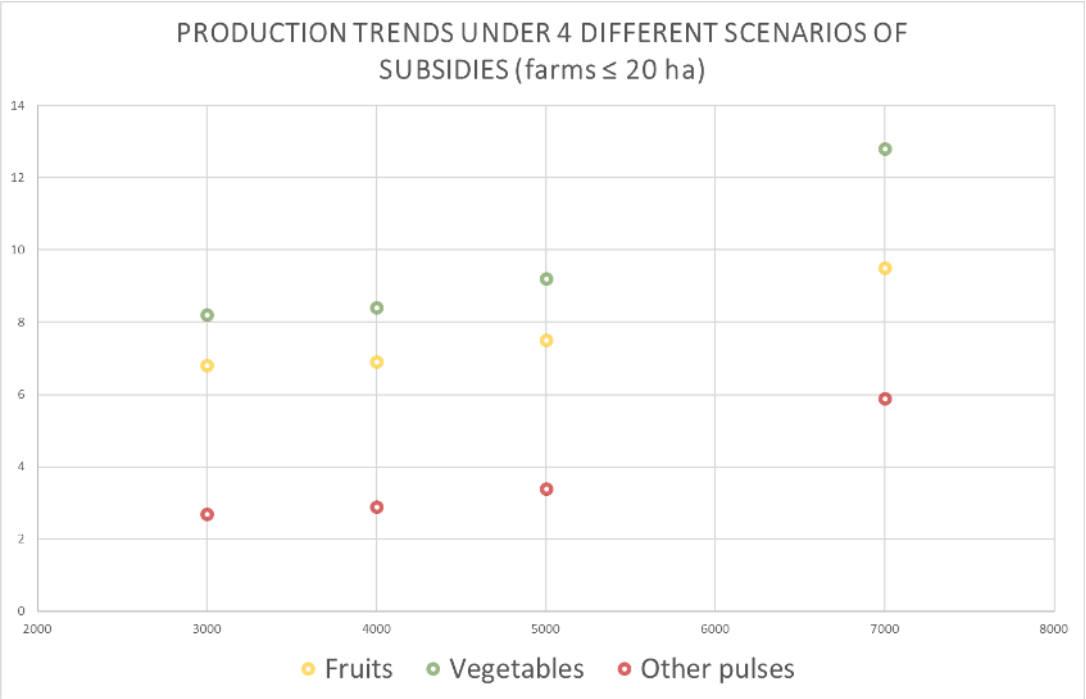

Figure 5 Percentage of production increase under different payment scenarios (3000 €, 4000 €, 5000 €, 7000 €; farms ≤ 20 ha)

For the estimation of the necessary social costs for the implementation of the examined scenarios, we have made the assumption that all small farmers in the two samples are willing to participate in the small farmers' schemes proposed in this study. Hence, we have extracted the necessary data on the total number of small farmers (both ≤ 10 ha and ≤ 20 ha) by Agreste database and we have multiplied it with the value of each scenario. In the following table we present the findings of our estimation.

Scenarios	Social costs (M€) Farms ≤ 10 ha (92247 ha)	Social costs (M€) Farms ≤ 20 ha (99714 ha)
Scenario 1	276,741	299,142
Scenario 2	368,988	398,856
Scenario 3	461,235	498,570
Scenario 4 / Strong innovative	645,729	697,998

Table 4 Social costs of subsidies in four different scenarios for small farms' schemes.

In parallel, we have tested four additional scenarios based on voluntary coupled payments, without any size limits for farms. The four incentive schemes consist of 1000 €, 2000 €, 3000 € and 4000 € per hectare. As expected, in figure 6 the trend shows for fruits, vegetables and other pulses, a positive and strong correlation between subsidy increase and agricultural production growth.

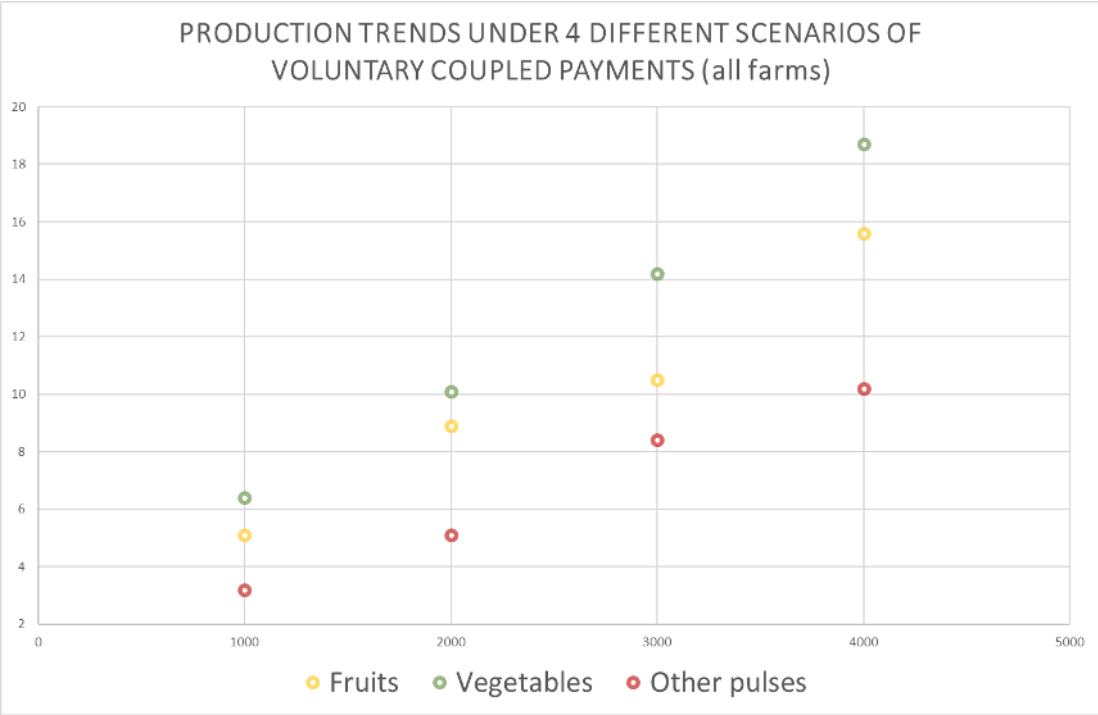

Figure 6 Percentage of production increase under different scenarios of Voluntary Coupled Payments (1000 €, 2000 €, 3000 €, 4000 €)

After having established the positive correlations between subsidy increase and agriculture production growth, we explain how such responsiveness and changes in the production level of fruits and vegetables can contribute to meet the related national nutritional requirements. In doing so, for each set of scenarios, we have isolated the strongest, and the most expensive, scenarios for farms ≤ 10 ha, ≤ 20 ha, and for voluntary coupled payments, namely 7000 €/ha and 4000 €/ha. As expected, figures 7, 8, and 9, show positive correlations between subsidy increase and the growth of agricultural production. In figure 7 we observe that the strongest scenario for farms ≤ 10 ha can contribute to fill more than 40% of the gap between the current situation and the nutritional requirements needed from national production of vegetables. For fruit production, within the same scenario this can be increased and contribute to fulfil 8% of the gap towards the required level of nutritional recommendations. In general, across these three graphs, and according to the modelling exercise, it is interesting to observe that the production of vegetables might grow to a much greater extent than fruit production. For instance, a social cost increase of 50 M€ between the strong innovative scenario for farms ≤ 10 ha and for farms ≤ 20 ha, results in a further contribution of 20% more towards the fulfilment of the national nutritional requirements for vegetables production, while for fruits it accounts only for a very low increase of this contribution (<3%). Consistently, the test on the strongest scenario for the voluntary coupled payments shows that through this scheme the vegetables production could contribute to fulfil 90% of the gap to reach the national nutritional requirements, while for fruits this contribution reach only 18% of the gap. This difference is partially explained by the fact that the installation of fruit trees/perennial crops requires an important financial investment and longer periods of time between plantation and

fully productive trees (FAO, 2016). Thus, it is likely that higher and targeted incentives should be designed in order to motivate small farmers to further invest in fruit production.

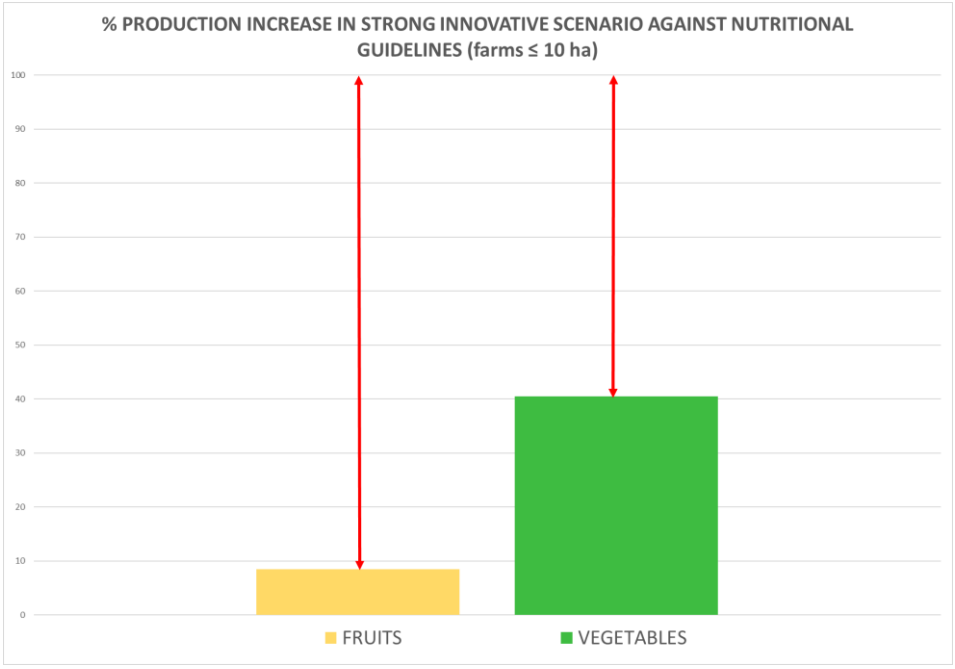

Figure 7 Percentage of production increase in strong innovative scenario and gap with nutritional requirements (farms ≤ 10 ha)

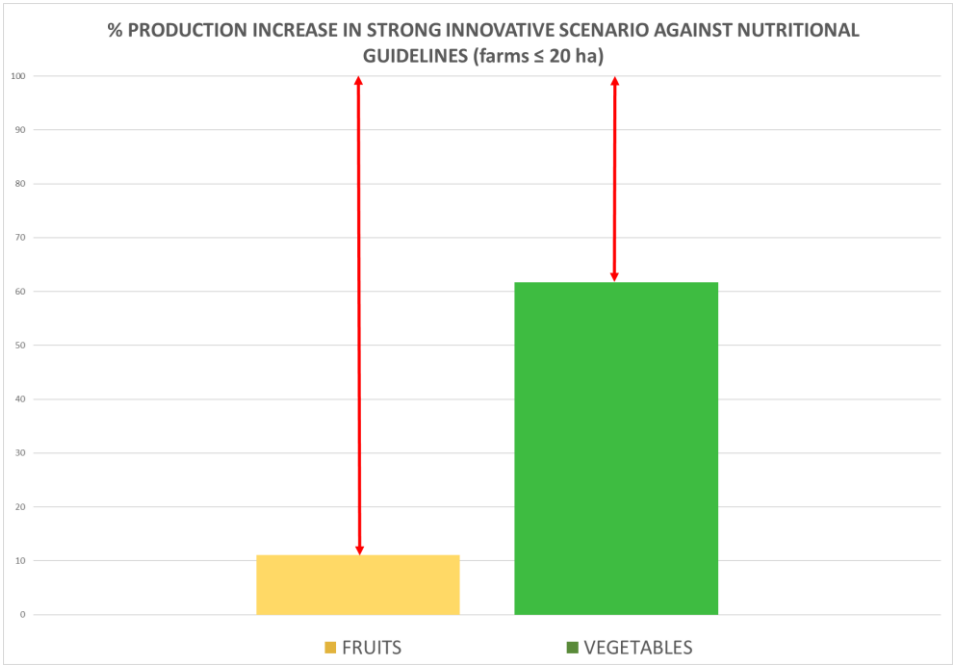

Figure 8 Percentage of production increase in strong innovative scenario and gap with nutritional requirements (farms ≤ 20 ha)

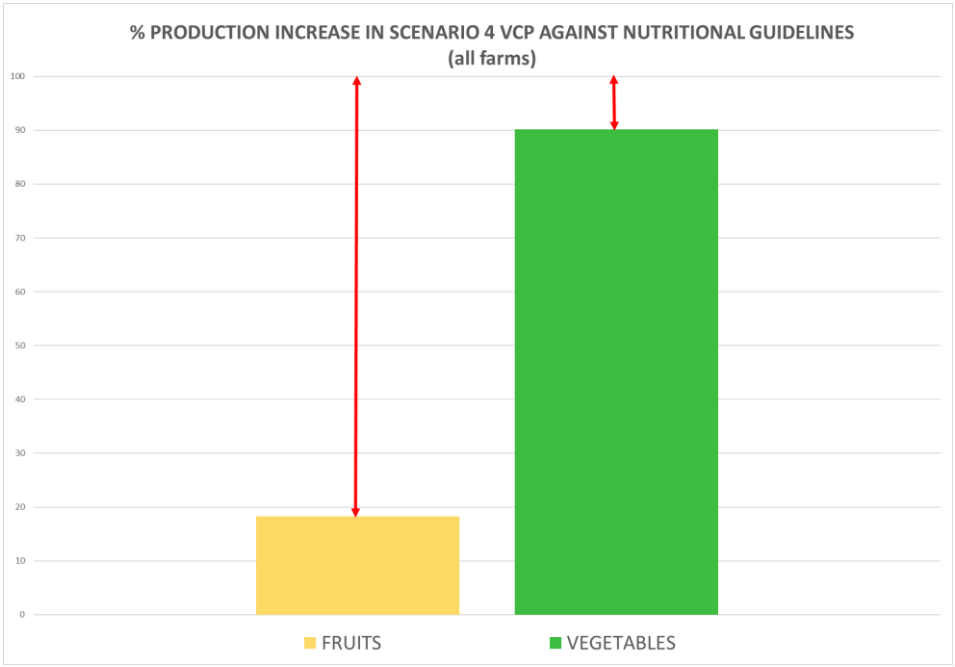

Figure 9 Percentage of production increase in scenario 4 of Voluntary Coupled Payments and gap with nutritional requirements

With regards to "Other pulses" the data are displayed in a different graph (Figure 10), as the size of the percentage increase is significantly lower. In fact, for the strong innovative scenario and for the highest level of voluntary coupled payments, the model shows a very slow progression of the "Other pulses" growth in production (between 0,2% and 0,9%, figure 10).

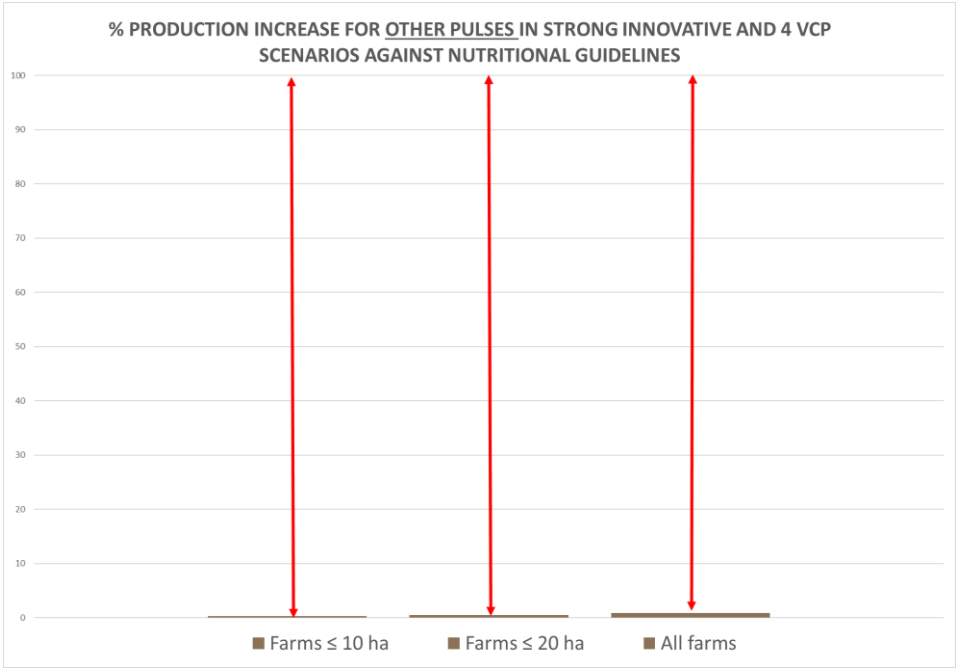

Figure 10 – Percentage of production increase of farms in strong innovative small farm scheme and in scenario 4 of Voluntary Coupled Payments and gap with nutritional requirements (Other pulses).

With regards to consumption responsiveness (assessed as availability of food for consumption) of French population to product-based subsidies in different scenarios, the general trends that have already been observed for production are confirmed. Strongest financial subsidies imply higher consumption of fruits, vegetables and other pulses (figures 11, 12, 13).

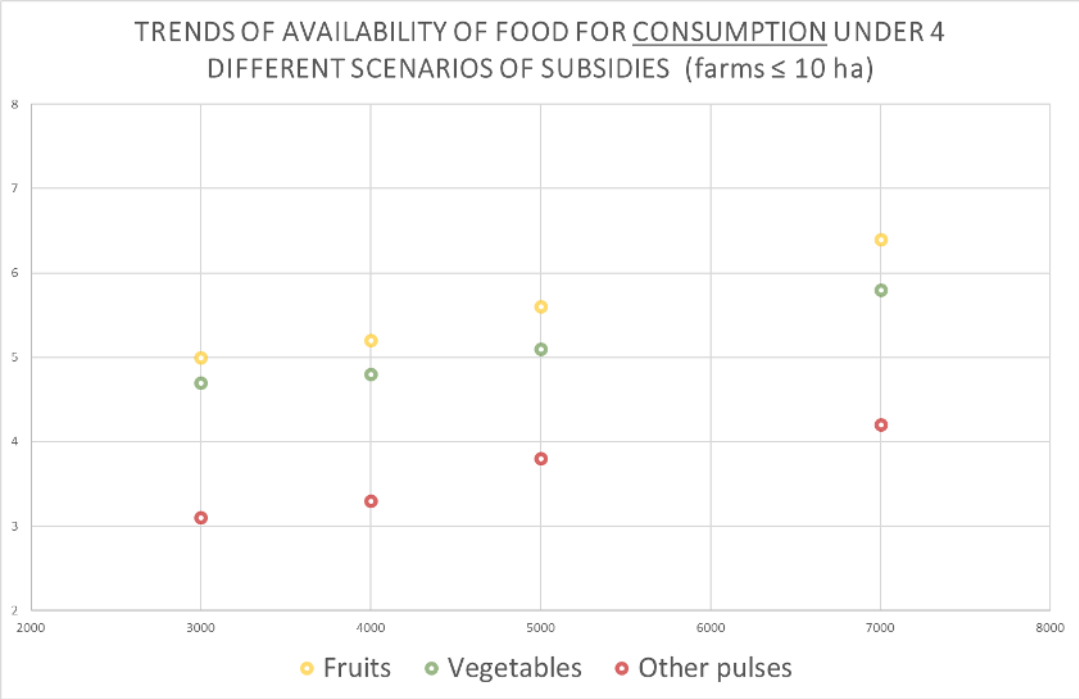

Figure 11 Percentage of consumption increase (assessed as availability of food for consumption) under different payment scenarios (3000 €, 4000 €, 5000 €, 7000 €; farms ≤ 10 ha)

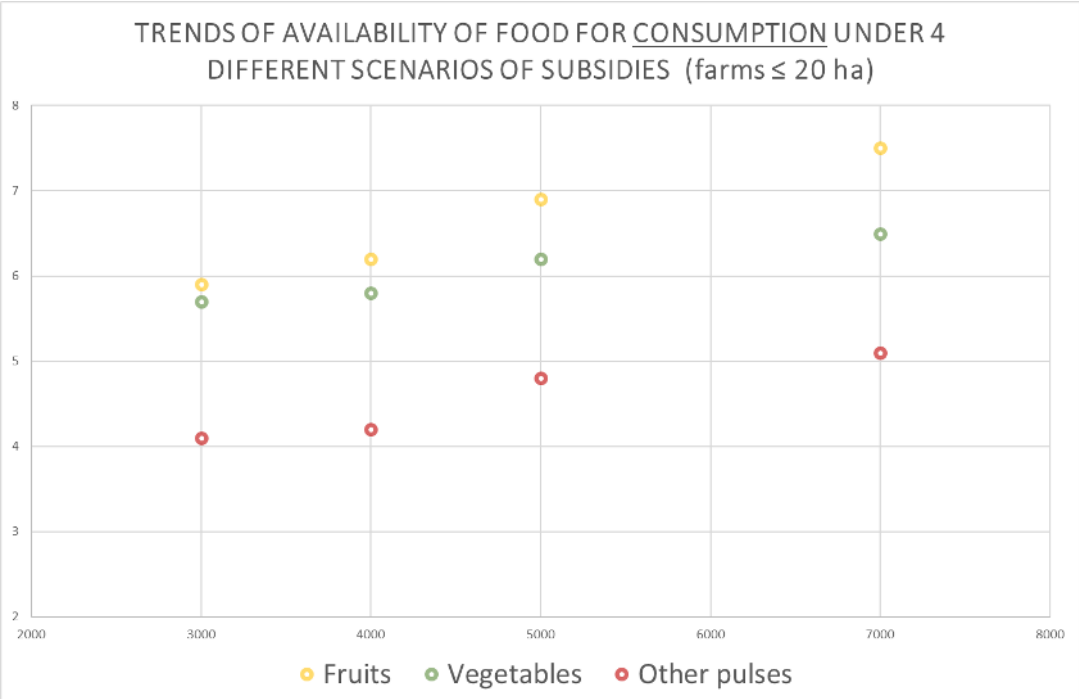

Figure 12 Percentage of consumption increase (assessed as availability of food for consumption) under different payment scenarios (3000 €, 4000 €, 5000 €, 7000 €; farms ≤ 20 ha)

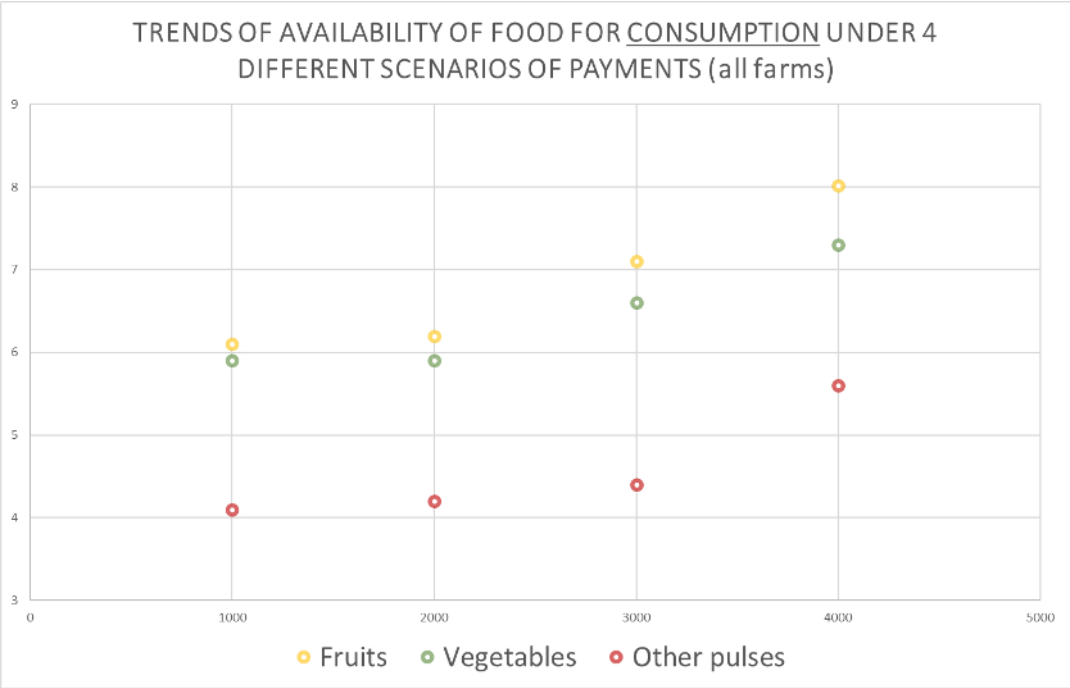

Figure 13 Percentage of consumption increase (assessed as availability of food for consumption) under different scenarios of Voluntary Coupled Payments (1000 €, 2000 €, 3000 €, 4000 €)

The impact of subsidies on consumption (assessed as availability of food for consumption) and the related contribution to fill the gap towards the satisfaction of nutritional requirements is particularly marked for vegetables. Thus, the subsidy-based increase in the contribution to fill the gap of consumption towards the fulfilment of nutritional requirement is very high for vegetables (respectively 78%, 88%, 99% for the three strongest scenarios) and for other pulses is extremely low (respectively 1,2%, 1,4%, 1,6% for the three strongest scenarios) (figures 14, 15, 16). Increase in consumption of fruits (assessed as availability of food for consumption) is not displayed as the aggregate data show that fruit consumption already achieves the nutritional requirements established by the national guidelines.

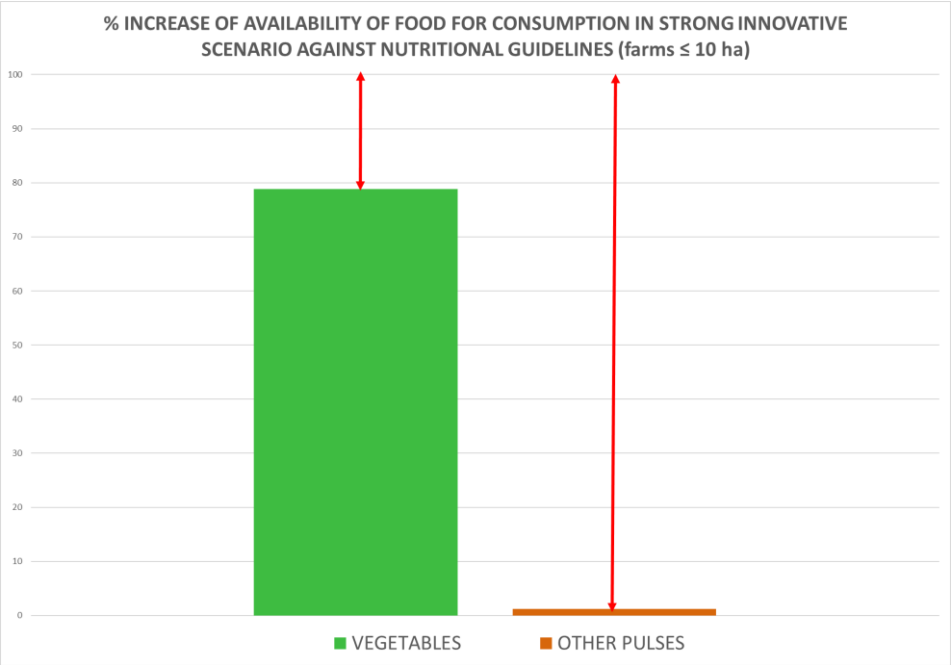

Figure 14 Percentage of consumption increase (assessed as availability of food for consumption) in strong innovative scenario and gap with nutritional requirements (farms ≤ 10 ha)

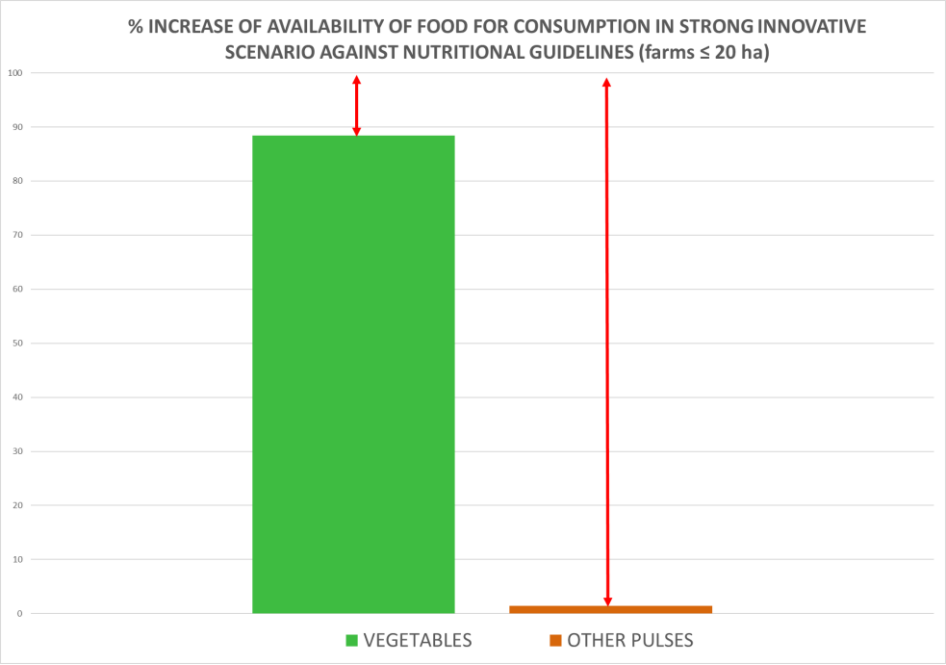

Figure 15 Percentage of consumption increase (assessed as availability of food for consumption) in strong innovative scenario and gap with nutritional requirements (farms ≤ 20 ha)

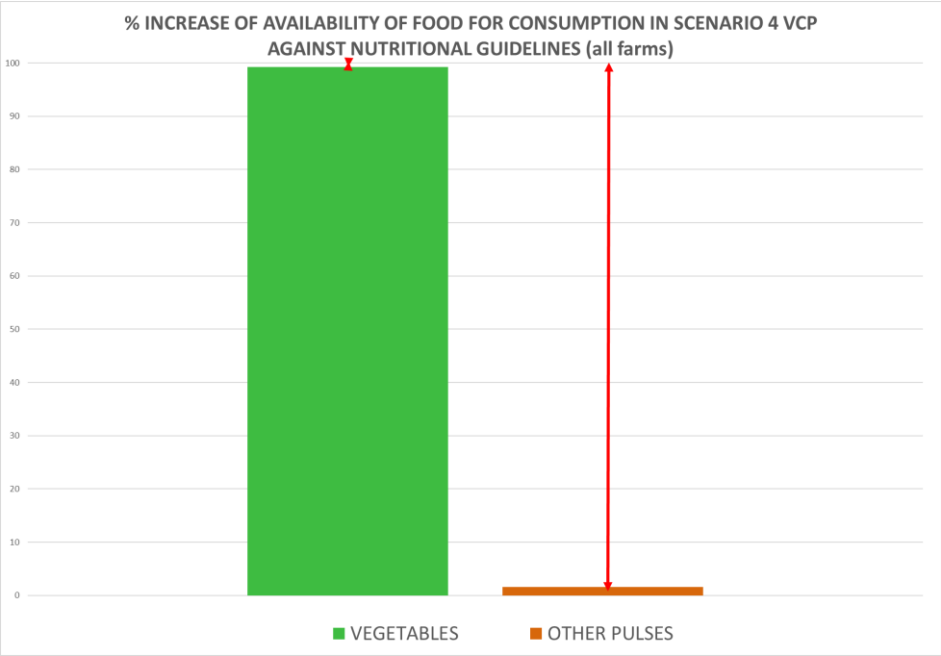

Figure 16 Percentage of consumption increase in scenario 4 of Voluntary Coupled Payments and gap with nutritional requirements

These findings clearly suggest that, according to this model and despite the heavy social costs, subsidies oriented to different farms for fruits, vegetables and pulses crops positively impact on agricultural production, with significant results for vegetables in the perspective of the fulfilment of nutritional requirements for population, based on hypothetical self-sufficiency of France for these crops. It is also clear that consumption subsidy schemes lead to a strong increase of vegetables consumption (assessed as availability of food for consumption) while for pulses consumption, at least for the group "Other pulses", the increase is very low as there is only a slight contribution to fulfil the consumption gap for pulses towards the nutritional requirements. It is important to observe that the difference between the increase of consumption of vegetables and consumption of pulses is not only explained by the different percentage of consumption growth but mostly to the current base level of consumption (assessed as availability of food for consumption), which is very low for pulses and relatively high for vegetables. Furthermore, the very low responsiveness of pulses production and consumption to subsidies can also be explained by the particularity of the pulses sector. In fact, as it has been explained above, food is not the only utilization for pulses as animal feed and seed production (peas, fava beans, horse beans, etc.) represent the two competing utilizations of this product group (especially animal feed). Thus, pulses production for human consumption in France is in competition, on the one hand, with internal production oriented towards animal feed and, on the other hand with well-established import of pulses for food. In addition to the low level of consumption of pulses at present, these factors might explain in part the low impact of subsidies on the increase of production and consumption.

Potential impact and responsiveness of small farms' production increase across value chains of fruit, vegetables and pulses

Building on the findings presented above, when small farms are subsidized with incentives for producing fruits, vegetables and pulses, their production of these products increases. Provided with an upgraded capacity of supply, small farms would be able to have a different position within value chains of the related products. On the one hand small farms will be able to propose lower prices for their products in the market, as production costs would be in part supported by subsidies. However, small farms could also take advantage of their greater capacity of supply and propose larger quantities in the market without decreasing sale prices as their power across value chains is likely to be strengthened because of more important supplies. Of course, these dynamics of taking more power within value chains could be further strengthened if small farmers are able to coordinate their supply in the market through horizontal arrangements. In so doing, sale prices could be preserved or increased in the face of the competition in the markets. Quality certifications or geographical indications are also crucial tools for increasing value added - and then strengthening market power - to upgraded levels of supply from small farms.

In general, with an increased supply of fruits, vegetables and pulses, competition in the national market will change and grow. Complex interactions and systemic dynamics will be activated within value chains and the markets. A supply growth for fruits, vegetables and pulses from small scale farming will characterize the markets. While small farmers – if appropriately coordinated – will be able to interact and negotiate with wholesalers and large retailers, the latter will in the meanwhile tend to position into these markets by increasing the proposition of niche local fruits, vegetables and pulses. Furthermore, also relationships between small farmers and local retailers will change with new potential arrangements for valorization of local products and local value chains.

At a national level, a larger supply of fruits, vegetables and pulses will also generate greater interest for export markets, especially if small farmers will be able to horizontally coordinate their supply, negotiation power and arrangements for improving the value added of their products. In addition, among new market opportunities for small farmers, public procurement as an alternative market channel could be more easily accessed by small producers since they will be able to propose larger supply through coordinated horizontal arrangements. Moreover, green public procurement of local products is a growing market channel that could represent a potential opportunity for small farmers engaged in sustainable and organic practices.

With regards to consumption, significant impacts on consumption are observed on products that are already largely consumed (vegetables) and not for products concerned by competing interests for their utilization (such as feed and seed for pulses). Therefore, production support

measures need to be combined with interventions aimed at balancing feed with food supply and market for pulses. Furthermore, beyond production measures for fruits and vegetables, other parallel supply chain and demand-creation interventions can be envisaged to promote and increase consumption of vegetables and pulses, as those are the products that are not consumed to an adequate nutritional extent in France. With specific regards to small scale production of fruits, vegetables and pulses, several initiatives in France have combined efforts towards the integration of small scale farmers in the market with activities aimed at promoting consumption of healthy products such as fruits, vegetables and pulses.

In particular, a number of projects and studies in France show that the change towards healthier, and sustainable, consumption patterns is not simply related to the supply and proposition of products, but this change is strongly influenced by the development of social links between and within consumers, small farmers, and other actors of short and local value chains. A concrete example is presented by Chiffoleau et al. (2017) who show how the institution-driven establishment of an open-air market (i.e. *marché de plein vent*) in the outskirt area of Grabels, in the city of Montpellier, allowed the adoption of healthy and sustainable consumption patterns with local products. Building on this initiative and study, this practical case shows that the increase of the consumption of healthy, local, sustainable and fresh products is tightly connected with the links that were built between producers and consumers on learning about the origin, quality and intrinsic characteristics of products, as well as among consumers through exchange of information that triggers co-learning and awareness on product characteristics. Other real cases in France show that local availability of vegetables can embed production from orchards or family gardens to significant extents. A practical example is reported by Marie (2019) who assessed the contribution of vegetables produced in domestic gardens to the local food systems in three cities of the North-West of France. In fact, in the cities of Rennes, Caen, and Alençon, it was observed that domestic production, although often underestimated, can be significant with amounts that vary from 5% to 18% (depending on the city) for local consumption of vegetables.

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Annex: Metadata

Databases:
Agreste: https://agreste.agriculture.gouv.fr/agreste-web/disaron/GraFra2020Integral/detail/
FAOSTAT 2018: http://www.fao.org/faostat/en/#data/FBS

Indicators:
National Production, Import, Export, Availability of Food for Consumption, Farm production

Characteristics of samples:
Small farms ≤ 10 ha; Small farms ≤ 20 ha

PNNS4 nutritional recommendations:
- 1 portion of Fruits or Vegetables or Pulses = 100 g
- 5 portions Fruits/Vegetables per capita/day
- 2 portions of Pulses per capita/week

Aggregate data for fruits, vegetables and pulses:
- Potatoes are excluded from calculation of vegetables production, import, export, consumption (food).
- Feed for animals is excluded from calculation.
- Seed utilization is excluded from the calculation.
- Product categories of fruits, vegetables and pulses are assessed as fresh and unprocessed products (for instance apples for cider and grapes for wine are excluded from calculation).

Pulses:
According to FAO, pulses are annual leguminous crops yielding between one and 12 grains or seeds of variable size, shape and color within a pod, used for both food and feed. The term pulses is limited to crops harvested solely for dry grain. The term "pulses" is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food (green peas, green beans, etc.) which are classified as vegetable crops. Also excluded are those crops used mainly for oil extraction (e.g. soybean and groundnuts) and leguminous crops (e.g. seeds of clover and alfalfa) that are used exclusively for sowing purposes.
http://www.fao.org/economic/est/est-commodities/pulses/en/