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# A NEW "SUSTAINABLE" TAXATION: THE CARBON (MEAT) TAX

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**Abstract**

The latest assessment report on climate change published by the Inter Government Panel on Climate Change (IPCC), among the concretely implementable tools to avoid the increase in global temperature, includes the need for a change in eating habits towards diets with low carbon content, which lead to a greater consumption of vegetables and fruit and a substantial reduction in that of red meat. This change in diet would also help limit the negative effects associated with obesity and overweight. A transition towards a healthy and sustainable diet is therefore necessary. There are many strategies useful for this purpose. These also include taxation which can be implemented in the use of already existing fiscal instruments (reduction or increase in VAT applied on more or less healthy products) or in the introduction of new taxes, capable of making the prices of the taxed products inclusive of the negative externalities resulting on an environmental and healthy level. The opportunity - from a promotional perspective - of a taxation of this kind emerges from multiple profiles: it can, in fact, contribute to the objective through the price increase deriving from the levy (and the related dissuasive force) but also with the desirable finalization of the revenue thus received to finance accessory measures of a non-authoritative nature (investments in sustainable production, reduction of VAT on healthier foods, establishment of awareness campaigns, etc.) which, in a multi-sectoral logic, must necessarily exist.

***Keywords:*** *Climate change, eating habits, obesity, fiscal instruments, carbon tax*

## 1. Introduction

The objective of this article is to highlight the current role of tax law not only as a tool for obtaining public resources, but also as a guide to taxpayers' conduct towards more virtuous choices.

This, however, does not mean that, in taxes with this purpose, the recovery function is completely non-existent. In fact, by determining the application of an additional cost on the activities involved, they still represent a monetary income for the State. In this way, the traditional function is combined with the disincentive function, according to a mechanism (contrary to the usual one) which, if functioning, should induce citizens to adopt different attitudes compared to those taxed, with a consequent reduction in the revenue collected.

This category includes those taxes which, through imposition, attempt to address epochal problems such as the fight against air pollution (taxes on the environment) and the protection of human health, in terms of reducing pathologies related to conditions of obesity and overweight (taxes on junk food).

The examples of fiscal measures specifically dedicated to environmental protection are many and different from each other: taxes on plastic packaging, on CO2 and greenhouse gas emissions, on mineral extraction, on nuclear fuel, etc. Numerically lower, although increasing in recent years, are the hypotheses of taxes that aim to reduce the causes of excess weight.

What is missing, however, is a single taxation that (by increasing the price) is able to target – at the same time - products considered harmful to both the environment and health. This is not an entirely abstract hypothesis. In fact, the correlation between healthy foods and less polluting foods has now been demonstrated by multiple studies.

In the following analysis, we discuss the opportunity of such a joint intervention, identifying

both the reasons that justify - for the resolution of these problems - the use of a drastic instrument such as taxation and the methods necessary to make these taxes truly useful for their disincentive purpose.

## 2. The social reasons behind a tax intervention: some data

According to the latest (IPCC, 2019) assessment report on climate change published by the *Intergovernmental Panel on Climate Change* (IPCC), [11] approximately 23% of greenhouse gas emissions of human origin come from agriculture, forestry and other land uses (so-called AFOLU). [12]Of particular relevance are the data referring to livestock activities, whose current greenhouse gas emissions represent approximately 80% of those of the entire agricultural sector.

In general, the IPCC Report records a constant increase in estimates, noting that since 1960 the consumption of calories per capita has increased by about a third and that relating to meat has more than doubled. It is also highlighted that the use of chemical fertilizers has increased nine times and the natural areas converted into agriculture are now 5.3 million km², with water consumption for irrigation equal to 70% of total human consumption of fresh water.

With these data it is now possible to state, with a certain degree of certainty, the unlikelihood of achieving, in the near future, the objective of avoiding an increase in temperatures above 1.5 °C compared to pre-industrial levels, the maximum threshold established by Paris Agreement.[1] [2]

In fact, with the expected growth of the world population [3], of food demand and, therefore, of the related consumption of products of animal origin [4] the reported figure could reach 27% by 2030 (Pinto, 2021) and even cause, with the arrival of 2050, an increase of emissions from food production up to 80%.

Regarding the European Union (European Court of Auditors, 2018), the situation is no better; the agricultural sector, in fact, is considered responsible for 10.3% of greenhouse gas emissions and almost 70% of them come from the livestock sector.[5]

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[11]The IPCC, established in 1988 by the *World Meteorological Organization* (WMO) and the *United Nations Environment Program* (UNEP), today represents the main international body for assessing climate change.

[12] Specifically, agriculture is responsible for approximately half of the human-induced methane emissions (whose main source is found in the enteric fermentation of ruminants) and is the main source of nitrous oxide (especially deriving from the management of manure, from the use of nitrogen fertilizers and from atmospheric nitrogen deposition): two very strong greenhouse gases.

[1] The agreement, signed by 177 countries (including Italy) on 22 April 2016, aims to strengthen the global response to the threat of climate change, also through "*maintaining global average temperature to well below 2°C above pre-industrial levels, and pursue action to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this could reduce the risks and effects of climate change significantly*".

[2] Today warming produced by human activities has already reached a level of around 1°C compared to the pre-industrial period. In the decade 2006-2015 the temperature increased by 0.87°C (±0.12°C) compared to the pre-industrial period (1850–1900). If this trend of temperature remains unchanged in the coming years, human-caused global warming would reach 1.5°C around 2040. IPCC (2019), *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*.

[3] The latest UN projections suggest that the world population could grow to around 8.5 billion in 2030, around 9.7 billion in 2050 and around 10.4 billion in 2100 (UN, 2022).

[4] Considering the growth of the world population, the demand for meat is expected to increase by up to 70% by 2050 (FAO, 2012).

[5]As regards Italy, according to the National Inventory of Atmospheric Emissions drawn up annually by the Higher Institute for Environmental Protection and Research (ISPRA) - Department for Environmental Evaluation, Controls and Sustainability, "*emissions from the agriculture sector contribute on average for approximately 7% compared to total emissions in the period 1990-2021.* […] *Emissions from the agriculture sector can be broken down into different contributions. In detail: enteric fermentation, generated by reactions in the digestive system of livestock (particularly ruminants), constitutes over 40% of emissions on average; the management of manure in storage accounts for approximately 20% on average; the management of agricultural soils contributes 32% on average, which can in turn be broken down into the spreading of livestock waste, about 10% and the application*

It is therefore evident that the composite need to guarantee sufficient food for future generations, while minimizing the environmental impact, makes it more urgent today than ever to direct not only the entire production chain towards more sustainable choices food but also, and perhaps above all, the nutritional habits of individuals, trying to reduce the consumption of products which have the greatest impact on the environment throughout their life cycle.

According to some studies (GreenPeace, 2019), for example, meat consumption in the European Union should decrease by 71% by 2030 and by 81% by 2050, to reduce agriculture's contribution to climate collapse.

This would mean a change, in terms of the weekly average consumed individually, from the current 1.58 kilograms to no more than 460 grams of all types of meat by 2030 and 300 grams in 2050.

The IPCC Report, among the tools that can be effectively implemented for the precise purpose of avoiding the rise in global temperature, identifies the need for a general change in eating habits towards low-carbon diets, which involve a greater consumption of vegetables and fruit, as well as and a reduction in red meat consumption.[6]

The correlation between healthy foods and foods with low environmental impact has been recognized by multiple studies (Van Dooren et al., 2017). For example, the research carried out by the *Barilla Center for Food & Nutrition* (BCFN, 2016) appears to be particularly relevant.

In it, the so-called "double pyramid" was preliminarily elaborated i.e. the combination of an "environmental pyramid" – which evaluates the environmental impact of foods [7]- with the traditional "food pyramid" based on the so-called. Mediterranean diet.

From this, it was then possible to notice how the foods for which greater consumption is recommended (fruit and vegetables) by nutritionists are also those with a lower environmental impact.

Also interesting is the innovative assessment carried out by the University of Oxford (Clark et al., 2022) concerning, for the first time, the environmental impact of packaged foods. Previously, in fact, the multitude of ingredients necessary for the preparation of these products had constituted a significant obstacle to their analysis from the examined aspect.

The researchers, highlight the need for an extensive action that concerns all emissions, including those which, even if they do not have a marked impact, still contribute significantly to the phenomenon. To this end, they analyzed approximately 57 thousand products packaged and marketed throughout the UK and Ireland.[8]

Now, even in this case, the comparison of the estimated average environmental and nutritional impact of retail aisles containing only food products suggests a tendency for the more environmentally sustainable aisles to be more nutritious than the less sustainable ones.

This information highlights the reduction in greenhouse gases potentially resulting from this change in diet.[9] The choice towards healthier products would also contribute to curbing the negative effects connected to the so-called phenomena of overnutrition (obesity and overweight), producing countless advantages also from the more general point of view of human health. Even from this last aspect, in fact, the data are rather alarming, highlighting a situation in which the intergovernmental efforts necessary to find effective prevention solutions become even more difficult.

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*of fertilizers (synthetic and organic) and other nitrogen sources, about 22%"* .

[6]A widespread transition towards healthier diets could free an area of 4-25 million km² by 2050 and would have a reduction potential of 0.7-0.8 Gt CO2 eq per year by 2050.

[7]To this end, the BCFN study quantifies the environmental impacts of foods through three environmental indicators: *i*) *Carbon Footprint* which measures greenhouse gas emissions during the entire life cycle of the food and is calculated in grams of CO2 equivalent (gCO2 eq) per kilogram or liter of food; *ii) Water Footprint* quantifying the consumption and methods of use of water resources and is measured in liters of water per kilogram or liter of food; *iii*) *Ecological Footprint* which calculates the earth's ability to regenerate resources and absorb emissions and is measured in global square meters per kilogram or liter of food.

[8]Environmental impact estimates for food products are obtained through four indicators: *i*) greenhouse gas emissions; *ii*) scarcity-weighted water use; *iii*) land use; *iv*) potential for aquatic eutrophication.

[9]According to the IPPC Report (2019) cit. a widespread transition to healthier diets could free an area of 4-25 MKm by 2050 and would have a reduction potential of 1.8-3.4 Gt CO2eq per year by 2030 an emission reduction comparable to emissions from global deforestation.

According to «*World Obesity Atlas 2023*» report [10], published on the occasion of the World Day against Obesity on March 4, by the *World Obesity Federation (World Obesity)*, estimates relating to global levels of overweight and obesity suggest that over 4 billion people could be affected by these pathologies by 2035, compared to over 2.6 billion recorded in 2020. There would therefore be a passage from 38% of the total world population in 2020 to over 50% in 2035 (data excluding children under 5 years).

The prevalence of obesity will be more marked among children and adolescents; in the period between 2020 and 2035, the percentage of children in the world who are obese or overweight will increase from 10% to 20% (with a greater increase in incidence - from 8% to 18% - in girls). [11]The report presents a profile for each State and as regards Italy obesity in 2035 will affect 31% of Italian adults, with an annual increase of 2% for them and 2.1% for children.

This increase in the prevalence of obesity, which the КОВИД-19 pandemic (World Obesity Federation, 2021) has also worsened, is currently difficult to mitigate. In fact, World Obesity observes that today «*no country has reported a decline in the prevalence of obesity in the entire population, and none is on track to meet the World Health Organization (WHO) target of no increase from 2010 levels by 2025*».

### 3. The use of taxation for disincentive purposes

The recommendations are clear: to achieve environmental objectives a transition towards a healthy and sustainable diet is necessary.

There are many strategies that can be implemented for this purpose and they impact the recipients in different ways. The starting point can certainly be found in the necessary increase in individual awareness on the topic. Initiatives in this category include, for example, the carrying out of campaigns aimed at increasing citizens' awareness of the health and environmental benefits of a balanced diet, the establishment of nutritional education programs in schools and the imposition of bans of *marketing campaigns* (especially aimed at children) concerning products considered harmful under the dual profile analysed.

However, this may not be considered sufficient. The numbers clearly demonstrate that entrusting the success of an epochal change such as the one requested only to the voluntary element of the consumer and, therefore, to the implementation by the same of "good nutritional practices" brings with it a strong margin of uncertainty. There are many variables to consider: radicalized local eating habits, difficulty in finding resources outside the home, economic crisis and consequent increase in the cost of raw materials, psychological or mood factors and so on.[12]

This insufficiency would seem to be supported by some data relating to the consumption of products of animal origin in the world (BCFN, 2016); this sector, in fact, receives a lot of attention because its containment would lead to a reduction of approximately a quarter of the greenhouse gas emissions generated by the entire food sector. On this topic, although data from recent years have recorded a positive relationship between lower meat consumption in some developed countries and awareness of its impacts on health and the environment, the road towards the adoption of sustainable diets still seems to be long.

[10]The report uses body mass index (BMI) for its analysis, an indicator calculated by dividing a person's weight in kilograms by their height squared. In line with World Health Organization guidelines, a BMI score would indicate overweight if higher than 25 and obesity if higher than 30.

[11]By 2035, obesity could affect around 208 million boys (100% increase) and more than double that among girls, reaching 175 million (125% increase).

[12] In this regard, a survey (Heard and Bogdan, 2021) conducted by *the Food Standards Agency* together with Ipsos MORI among consumers in England, Wales and Northern Ireland shows how 77% of participants managed to identify at least one obstacle that prevented them from following a healthier diet (while 14% of participants reported that they did not need to eat healthier or that they already follow a healthy diet) and the obstacles most encountered were: *a*) the higher cost of healthier foods (33%); *b*) the humoral factor, i.e. the idea of the unsuitability of healthy for relaxation, for reducing stress or, in general, for feeling better emotionally (22%); *c*) the difficulty in acquiring new and healthier habits (19%).

And this is because such awareness would not be correlated with a real intention of individuals to change their consumption habits (Graça et al., 2014). We must then consider (Macdiarmid et al., 2016) that in many developed countries meat is still associated with cultural and social values and that in developing countries it is even considered a symbol of economic well-being.[13]

All these considerations generate the need to integrate these initiatives with authoritative measures on the supply side. The *Obesity World Report* cited maintains that «*governments should take steps to improve environments, using legal frameworks and regulation to protect all, including comprehensive marketing restrictions on foods high in fat, sugar and salt and strong mechanisms to protect the policymaking process from health-harming industries*».

The instrument of fiscal leverage can certainly be attributed to this last category. For this purpose, it can be implemented in two different practical ways: use of already existing tax instruments or modulation of the same based on concrete needs (reduction or increase in VAT applied on products, respectively, more or less healthy) or the introduction of new taxes that make the prices of the taxed products inclusive of the negative externalities deriving from them at an environmental and health level. In fact, if we consider the element of accessibility to food (which is a function of price and available income) as an aspect that conditions individuals' dietary decisions, the use of fiscal policies which, through a remodulation of prices, are able to influence the demand for foods considered (doubly) harmful can be considered a viable alternative (Turner et al. , 2018).

The use of taxation in order to discourage the consumption of certain products is, in reality, a very widespread practice. Today, there are many countries that adopt this tool, especially with reference to foods with a high content of sugars and saturated fats.[14]

The first *Global Nutrition Policy Review* (WHO, 2018) notes that 39 WHO member states have implemented fiscal policies of this kind (in particular, it highlights an increase in taxes on unhealthy foods and drinks or an increase in subsidies on healthy foods and drinks).

As regard the effectiveness of this instrument, although there is (especially compared to the experience with sugary drinks) an inferiority of evidence (Hammer, 2018) on the application of this taxation to unhealthy foods (such as, for example, foods rich in saturated fats, trans fatty acids, sugars or salt), the available data (Niebylski et al., 2015) suggest a good percentage of contribution of the tax measures in question to the reduction of purchases and consumption of the affected foods (Dodd et al., 2020) and also to the encouragement, in this case for companies manufacturers, to the reformulation of products towards healthier recipes (WHO, 2022).

Finally, as a demonstration of the need for an integrated intervention, involving multiple and various types of measures, the taxation examined would also seem to contribute to increasing the level of awareness among consumers, who would have from such "selective" imposition (i.e. concerning only some categories of products) a greater interest in the topic, inevitably generated by the question relating to the causes of the price increase and, consequently, by the reasons for the taxation.

### 3.1 A carbon tax on food products

The idea of a taxation which, at the same time, aims to affect the consumption of products considered harmful to health and the environment, although never concretely tested, has been the subject of numerous analyses.

A study by the University of Oxford, published in 2016, assessed the impacts of creating a global environmental tax on food products, based on the price of the carbon externalities of each product (Pinto, 2021).

In particular, the researchers, taking as the basis for calculating the tax the different carbon

[13] See Barilla Center for Food & Nutrition, *cit.*, according to which «*a survey conducted among university students in the United States showed that less than 10% of those interviewed associated meat with the issue of climate change. Even in Australia, only 22% of people believe that eating less meat can reduce environmental impacts*».
[14]Such as, for example, Hungary, Denmark, Norway, France, Mexico, United Kingdom, South Africa, Saudi Arabia, Tonga, Ethiopia, Bahrain, Kerala.

prices multiplied by the estimates of emissions of each food [15], concluded that, on an average price of around 52 dollars/t [16], a global tax would increase the price of beef by 40%, goat meat by 14.9%, pork by 6.8%, poultry by 8.5%, milk by 21% and eggs by 5.3%.

The only vegetable products which would record a significant increase in prices would be vegetable oils (with an increase of 25%), rice (with an increase of 8.2%) and wheat (with an increase of 7. 7%). However, in higher-income countries, which include most EU countries, the price increase would be slightly different: 26.6% for beef, 16.3% for goat meat, 8.3% for pork, 10.7% for poultry, 13.4% for milk and 6.6% for eggs. As regards vegetable oils, the increase would be 34.7%, for rice 10.1% and for wheat 9.6%.

By applying this tax, global emissions from food production would decrease by 9%, of which 1/3 would be attributable to the reduced consumption of beef and 1/4 to the reduced consumption of milk.

As mentioned, however, the objective of such a tax should be to guarantee benefits not only in environmental terms but also in the different, but related, profile of the protection of human health. From this point of view, the data shows that the introduction of such a levy should prevent around 146,000 food-related deaths per year, with a significant saving on healthcare costs (which, in the 15 EU countries under evaluation, would amount to 8.94 billion euros per year).

The hypothesis of a tax that only affects the consumption of meat (so-called *carbon-meat tax)* was instead identified – among the measure contained in the policy package called " *Farm to Fork* " - within the EU during of the event « *The True Price of Meat*».[17]

The tax in question was "inspired" by a Dutch foundation, the *True Animal Protein Price Coalition* (TAPP *Coalition)* - a partnership between health, environmental and animal welfare associations - which, precisely, considers the tax instrument one of the policy options that both the European Commission and Member States could pursue in order to improve the price of meat and the resulting environmental costs (TAPP Coalition, 2020).

In particular, the coalition, basing its proposal on the reports drawn up by the consultancy firm CE Delft and the Centre for Agriculture and the Environment (CLM), suggested the introduction of a tax on products of animal origin that would reflect the externalized costs and estimated values for beef, pork and chicken. According to the report, the tax should have been introduced gradually until 2030, reaching values of: *a)* 47 cents. per 100 g of beef, i.e. 4.77€ per kg (with a reduction in consumption of 67%); *b)* 36 cents. per 100 g of pork i.e. 3.61€ per kg (with a reduction in consumption of 57%); *c)* 7 cents. for every 100 g of chicken meat, i.e. 1.73€ per kg (with a reduction in consumption of 30%).

The values determined in this way, generating a notable reduction in consumption, could have contributed to a significant reduction in CO2-eq emissions, i.e. approximately less 120 million tonnes of CO2 per year.

Of particular interest is the finalization of the generated proceeds. The suggestion contained in the report was, in fact, to allocate the funds to finance a series of initiatives to support farmers and end consumers. And in particular: *i*) help to farmers to convert their production methods towards more sustainable models; *ii)* reduction of VAT on the production of plant foods considered healthy (legumes, fruit and vegetables); *iii*) support for food programs for low-income families.

The disincentive purpose that these taxes pursue requires that they be structured in such a way as to allow the achievement - from this point of view - of the best possible results in terms of the potential change in consumers' eating habits.

First of all, for the objective examined, it is considered necessary (Masselus, 2016) that the tax burden is entirely borne by the final consumer, who, unlike the producer, has a greater possibility of

[15]Although there is no unanimity on this point, the majority of studies conducted are in favor of taxing foods based on their specific environmental impact (carbon emissions), as the latter would be the only method to guarantee that the price of each food reflects effectively the externalities caused by its production (Pinto, 2021).

[16]The study also evaluates the hypothesis of a higher carbon price i.e. 78 $/to 156 $/t and states that, in this case, the results would be even more significant: emissions from food production would be reduced, respectively, by 12 % or 18.5% and mortality of 741,000 or 1.3 million per year (Pinto, 2021).

[17]The possibility, identified by three MEPs - two from the Socialists and Democrats (S&D) group and one of the Greens - in February 2020, however remained only an idea.

choice in order to the purchase of the product and, therefore, to the payment of the tax. If the tax were instead absorbed by the producer, the increase in awareness that the levy is intended to generate regarding the problems it aims to resolve would be lost. As already highlighted, it is important that consumers understand why they pay more for a particular purchase and, therefore, the reasons behind the new tax.

Secondly, it is important that the tax is implemented at a European level, to avoid the so-called "*carbon leakage*" (Pinto, 2021). From this point of view, the proximity of the EU countries (and the freedom of movement in force in them) could be such as to generate opportunistic behavior of the citizens of the "taxing" country, as they could be induced to avoid paying taxes by purchasing in neighboring countries which do not apply the tax and offer reduced prices (Vallgårda et al., 2014).

Categories of taxable foods are discussed.

In particular, it is not clear (studies on this aspect differ) whether, from the point of view the purpose, it is more useful to tax exclusively products of animal origin (beef, pork, chicken, eggs, milk and cheese) due of their considerable environmental impact and the excessive consumption of them or to address the tax in question to all foods, with a variable levy depending on the environmental impact produced by each of them. According to the supporters of this last variant, the "generalized" taxation would not prevent the verification of the promotional effect towards a healthy and sustainable diet, since the price increase (deriving from the tax) for plant foods would be so contained so as not to discourage their consumption.

Finally, it is necessary to consider the possible substitution effect deriving from the insistence of such taxes on food-type products. It is a phenomenon which is desirable, from the point of view of implementing the disincentive purpose, where the substitution is directed towards healthier food, but which must not be underestimated when there is a danger of excessive exploitation of resources (inevitably connected to the increase in consumption of other food categories).

Regarding this last hypothesis, think, for example, of the consequences deriving from an imposition intended to affect only the consumption of meat and which, instead, completely excludes the entire range of fish products from its scope of application (Pinto, 2021). The excessive shift towards such foods could, in fact, generate harmful effects for the environment also in relation to the worsening of the phenomenon of overexploitation of fishing areas, [18]with the related risk to nullify any positive results achieved, in terms of emissions reduction, following the institution of the levy affecting (only) meat consumption.

**Conclusion**

There are many studies on the topic and the expected effects are positive, however no country has yet managed to adopt a carbon tax on food products. The importance and urgency of the issues examined require greater flexibility of views from all operators in the sector, including consumers.

The opportunity - from the point of view of promoting healthy and sustainable eating styles - of a taxation that targets foods considered, at the same time, less healthy and with a greater impact on the environment emerges from multiple profiles: it, in fact, can contribute to the objective not only through the price increase that would derive from the levy and the related disincentive force, but also through the desirable finalization of the revenue thus received to finance accessory measures of a non-authoritative nature (such as, for example, investments in sustainable foods and production, reduction of VAT applied on healthier foods, establishment of awareness programs and campaigns, etc.) which, in a multi-sectoral logic, must necessarily exist.

[18]According to the FAO, around 75% of fishing areas are overexploited (FAO Newsroom, 2020). In the EU, fish consumption is above the limit for maintaining sustainable stocks. (European Environment Agency, 2019).

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