

“From the farm to the plate”: agro-biodiversity valorization as a tool for promoting a sustainable diet

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Sustainable diet

In the early 1980s Gussow and Clancy (1) described the notion of “sustainable diets” as ... *recommended diets that are healthier for the environment as well as for the consumers...* This concept, borrowed from “sustainable agriculture”, allowed to promote several activities with the aim to minimize the waste of natural resources and address to food production toward local and seasonal consumption. However, the concept of a sustainable diet is a complex issue and there are still many gaps in our understanding of what a sustainable diet might comprise (2). Effectively, the complexity of the concept is well represented by the Food and Agricultural Organization definition of a sustainable diet: *those diets with low environmental impacts, which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources* (3).

Starting from these definitions it is possible to underline as the concept of sustainable diets involves economic, environmental and socio-cultural issues that influence nutrition and health perspectives. So, integrating the notion of sustainable diets with a food chain approach, it should guide toward a multi-disciplinary strategy for counteracting the simplification of diets, loss of biodiversity and prevent possible erosion of food cultures.

Biodiversity and agro-biodiversity

According to Edward O. Wilson, the term “biodiversity” is intended as the entire variability or varieties of living-forms (4). Agricultural biodiversity, or “agro-biodiversity”, is a part of this variability and represents the diversity of cultivated agricultural ecosystems in relation to genes, genes combinations within each species and combinations of biotic and abiotic elements (5). Biodiversity and agro-biodiversity are concepts relatively “new” which are not immediately understood by people. Effectively, the majority of European citizens admit that they do not feel adequately informed on biodiversity, since only 38% European people know the meaning of these terms (6). For better understanding the concept of agro-biodiversity it could specify as biodiversity in vegetable crops is composed both by species diversity (inter-specific diversity) and diversity of genes within a species (intra-specific diversity), referring to the vegetable grown varieties. In this context it is important to underline that, as regards intra-specific diversity, labor operated by farmers over centuries of selection has led to the creation of a plurality of local varieties, following domestication of ancient cultivated forms, and wild plants. This represents a precious heritage to save both from a genetic and a cultural-historical point of view (5). Therefore, the agro-biodiversity related to vegetable crop has assumed very articulated connotations. It is also important to specify that a “local variety” (also called: landrace, farmer’s variety, folk variety) is a population of a seed or vegetative-propagated crop characterized by greater or lesser genetic variation, which is however well identifiable and which usually has

a local name. These population are closely associated with the traditions, the knowledge, the habits, the dialects and the occurrences of the human population that have developed it and/or continue its cultivation (7). Finally, according to another definition of biodiversity proposed by the Food and Agricultural Organization, traditional knowledge may be regarded as an integral part of agro-biodiversity, because it is the human activity that forms and saves this biodiversity (8). Starting from these remarks, it is possible to underline as traditional foods and local gastronomy are strongly linked to the agro-biodiversity, since they could be considered as an important part of human activities related to environment and sustainable use of food.

Agro-biodiversity valorization and sustainable diets

The notion of a sustainable diet would have been curious a few hundred years ago, when traditional knowledge and practices ensured the conservation and sustainable use of food biodiversity within healthy ecosystems. But agriculture, diet and nutrition have changed so dramatically in recent decades that now the concept of a sustainable diet seems a novel. The current agri-food system is one of the greater responsible for ecosystem degradation and biodiversity loss. Moreover, it has proved to be unable to favor hunger and malnutrition in the world. In this regard it is important to underline that malnutrition, in its two contradictory aspects concerning undernutrition and excessive nutrition, is becoming one of the main threats to the worldwide population. Effectively, the number of undernourished people has increased to nearly one billion (9). On the other hand, also the problems of obesity and its associated chronic diseases are rising. This, coupled with the alarming pace of food biodiversity loss and ecosystem degradation, makes it a compelling case for re-examining agricultural systems and diets. Therefore, a radical change on how food is produced, thought and managed is needed. So, new food behaviors should be developed, proposed and disseminated in order to actively combat both hunger and the growing phenomenon of obesity in the framework of sustainable food systems.

Starting from these remarks, agro-biodiversity valorization could represent a very efficient tool for

promoting models of sustainable diets. Nevertheless, what is the meaning of agro-biodiversity valorization? How it can help to promote a sustainable diet?

For answering to these questions, it is important to specify as the concept of the agro-biodiversity valorization, related to vegetable crops, is a complex and articulated issue. It is not a case that different meanings can be attributed to this concept, since it may have different aims. For example, agro-biodiversity valorization could be addressed toward all those activities that allow to preserve genetic erosion, which is due to several factors such as abandonment of rural areas, ageing of the farming population and failure to pass information down the generations (leading to loss of knowledge and historical memory). In this context, necessary activities could include: 1) collecting and preserving memories and knowledge of biodiversity; 2) retrieving and identifying such local varieties within the territory; 3) characterizing, cataloguing and preserving them (10). On the other hand, agro-biodiversity valorization of vegetable crops could be addressed toward specific activities that allow to preserve the quality and boost consumer demand for local varieties. In this case it could be necessary to evaluate quality traits of local varieties for promoting their diffusion in the markets. Moreover, it could be also necessary to evaluate the suitability of this vegetables, as ready to use products after the application of a food process (11, 12).

Nowadays, several researchers emphasize benefits obtained by the linkage between food quality and agricultural biodiversity. This because niche food products, founded on quality and agricultural biodiversity and intended for local use, seems to meet requirements of consumers about safety and genuineness. So, especially for specific niche markets, in which there is high demand for local products grown with environmentally-friendly farming techniques, it is essential to disseminate the knowledge about local varieties. Quality should be identified as valorization of traditional agricultural patrimony, peculiarity of cultivation and uniqueness of typical products. Therefore, agro-biodiversity valorization requires a multi-disciplinary approach and integrated projects such as the case of Slow Food Presidia (13, 14). To this regard, the Presidia seek to promote sustainable farming systems and, in partic-

ular, the protection of the local varieties at risk of genetic erosion as well as local traditions. The Slow Food Presidia is a project that aims to protect a community of farmers and promote their artisan food products. In this way, it is possible to stimulate market opportunities and valorize a territory through the use of a model of sustainable agriculture and environmentally friendly. At the same time, also local traditions and cultural identity of people are preserved and promoted. Therefore, it must be assumed that each product is intimately linked to the local identity, with specific geographic characteristics, climatic, environmental and cultural. Other initiatives of Slow Food project should be mentioned such as the promotion of ecological packaging and the alliance between chefs and the local Presidia for promoting a sustainable gastronomy.

After all these considerations it could be more easy to understand how agro-biodiversity valorization can help to promote a sustainable diet. Firstly, agro-biodiversity valorization includes all activities aimed to counteract loss of biodiversity. Thus, the aims of these activities can be considered as an integral part of the concept of sustainable diets proposed by Food and Agriculture Organization (3). Secondly, agro-biodiversity valorization promotes the food use of a wide availability of genetic resources such as local varieties and wild edible plants. This allows to reduce the standardization of taste, flavor and visual aspect of the dishes (Fig. 1) and, contemporarily, it enrich the diet in terms of healthy compounds such as minerals, antioxidants and



Figure 1. Salad of a local variety of stem chicory seasoned with a mixture of bread crumbs, extra virgin olive oil, vinegar, mint and black pepper.

vitamins. Finally, agro-biodiversity valorization can be considered a tool which provides opportunities for conserving diversity in the cultural knowledge of foods and diets and understand local food systems. Therefore, since it also raises the question of safeguarding traditional knowledge on food and culture, this tool may be considered also as an “holistic” approach which evaluates the agro-biodiversity, “from the farm to the plate”.

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