Traceability through Blockchain in the agri-food chain

by Giancarlo Rando

Globalization has certainly transformed the agri-food sector and made it an extremely complex, varied market that involves a multitude of individuals operating with the most diverse interests and qualitative standards. In the effort of opposing the possible harmful effects of globalization on the quality of food, the European Union, with Regulation (EC) no. 178/2002 aimed at promoting cohesion between Member States, calling for the adoption of international technical standards, general safety requirements and uniform legislation on food, to ensure the same level of protection within the territory of the Union.

One of the tools deemed necessary for this purpose is the traceability of food, which became mandatory starting from January 1, 2006. In Italy, an Agreement was signed to ensure compliance with the traceability requirements (dated July 28, 2005, pursuant to 4, Legislative Decree 28 August 1997, no. 281) between the Ministry of Health and the Presidents of the Regions and the Autonomous Provinces, which provides, in art. 8, full freedom in the choice of instruments to enable the operators to trace with certainty the previous and subsequent links in the food chain. Consumers, by their side, require ever greater transparency to verify the safety and quality of food and increasingly want to be aware of the origin of the raw materials, the ways in which they were processed and stored.

In this context, the possibility of using the technologies known as Blockchain has emerged, through their application to the entire agri-food chain. The Blockchain technologies exploit the characteristics of a computer network of nodes and allow to manage and update a register containing data and information in a univocal and secure way. Management and updating take place in an open, shared and distributed manner, without the need for a central control and verification entity.

The application of Blockchain technology to the agri-food chain allows you to keep track of all the relevant information relating to a product, from the beginning of its production to the supermarket shelf: methods and products used in cultivation, information on cultivation environment, up to processing, conservation and delivery to the final retailer. Not only producers, processors and final sellers can track the relevant information, but also the final consumer, for example by reading a QR code, can check the same data.

Although the use of the Blockchain for these purposes is not yet widespread, there are experiments of its use, even by big corporations (e.g. Walmart has a pork and mango traceability project, using IBM Food Trust Platform based on Hyperledger Fabric; Carrefour has a poultry meat traceability project; Amazon Web Services is currently using Farmobile as an example of application of BCTs to farming and agriculture).

The paper intends to analyze, also taking into consideration some cases in which the technology has been tested, the advantages and any difficulties that arise with respect to a large-scale use of the Blockchain for tracking products in the agri-food chain. The use of

the Blockchain can have undeniable advantages, precisely due to the architecture of the technology, for all relevant information for the farmer/producer, the processor and the final consumer: decentralization, transparency, security, consent, integrity. At the same time, there are challenges and possible conflicts with other existing regulations: there is, in fact, no regulatory framework for Blockchain technologies; the cost of the products could increase due to the use of this technology; there are possible conflicts with the rules for the protection of privacy, both of the consumer (which could be profiled following the consultation of the Blockchain data) and of the farmers/producers, who may not legitimately want to share some data on production methods.