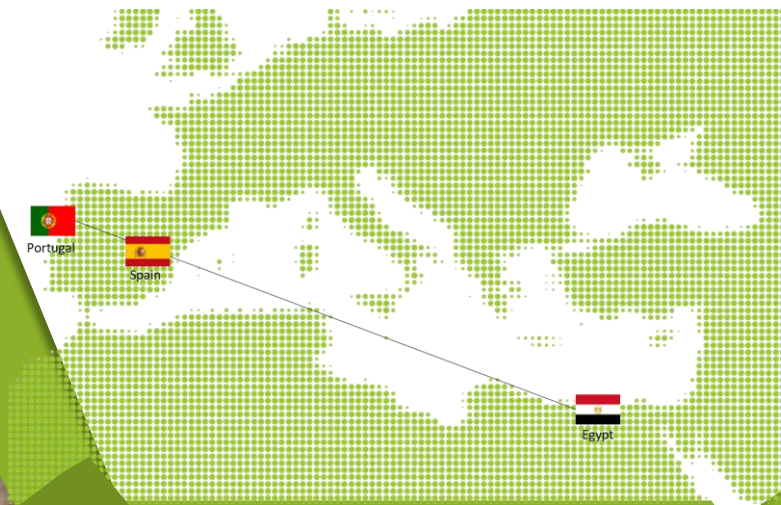




Trace RICE



Rice authenticity and traceability tools, pathways for Mediterranean rice chain valorisation

Carla Brites

May 17, 2022



TRACE-RICE with Grant nº 1934, (call 2019, section 1 Agrofood) is part of the PRIMA Programme supported under Horizon 2020, the European Union's Framework Programme for Research and Innovation



AUTHENTICITY & TRACEABILITY SOLUTIONS



1

• **QUALITY MODELS**

2

• **DNA BASED TOOLS**

3

• **INNOVATIVE RICE-BASED FOODS**

4

• **BLOCKCHAIN TECHNOLOGY**

INDUSTRIAL & COOKING QUALITY

Physical

- Size and shape
- Whiteness
- Vitreousness
- Milling yield

Chemical

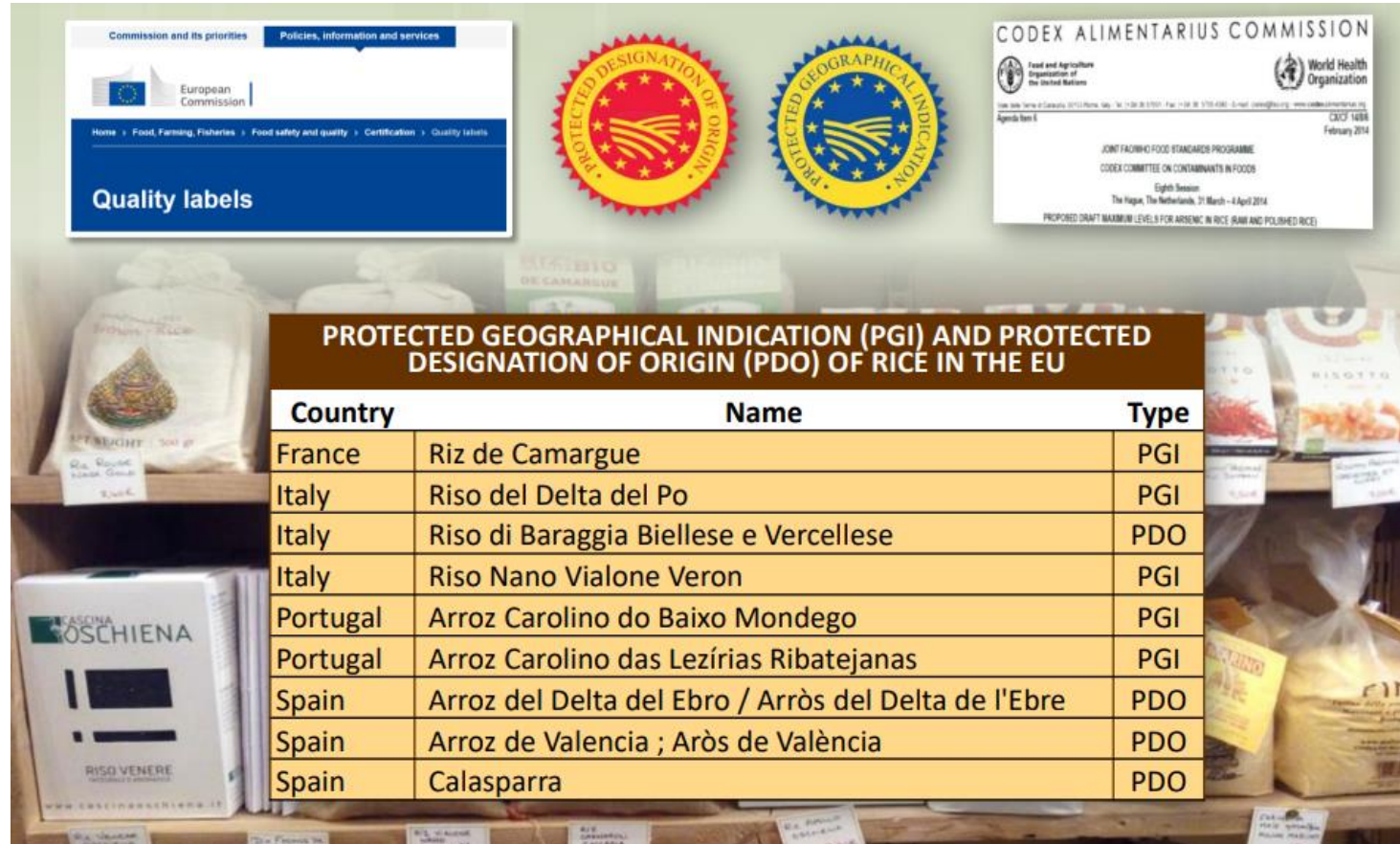
- Amylose

Physicochemical

- Viscosity profile
- Gelatinization temperature
- Texture

Organoleptic

- Sensory analyses
- Aromatic compounds



PROTECTED GEOGRAPHICAL INDICATION (PGI) AND PROTECTED DESIGNATION OF ORIGIN (PDO) OF RICE IN THE EU

Country	Name	Type
France	Riz de Camargue	PGI
Italy	Riso del Delta del Po	PGI
Italy	Riso di Baraggia Biellese e Vercellese	PDO
Italy	Riso Nano Vialone Veron	PGI
Portugal	Arroz Carolino do Baixo Mondego	PGI
Portugal	Arroz Carolino das Lezírias Ribatejanas	PGI
Spain	Arroz del Delta del Ebro / Arròs del Delta de l'Ebre	PDO
Spain	Arroz de Valencia ; Aròs de València	PDO
Spain	Calasparra	PDO

NUTRITIONAL QUALITY

- Nutrients
- Bioactive compounds

SAFETY QUALITY

- Mycotoxin
- Pesticides
- Heavy metals Arsenic

Use of Artificial Neural Network Model for Rice Quality Prediction Based on Grain Physical Parameters

ANN algorithms could be used to obtain robust models to predict both biochemical and pasting profiles parameters based on rice grain appearance



FROM THE EDITED VOLUME

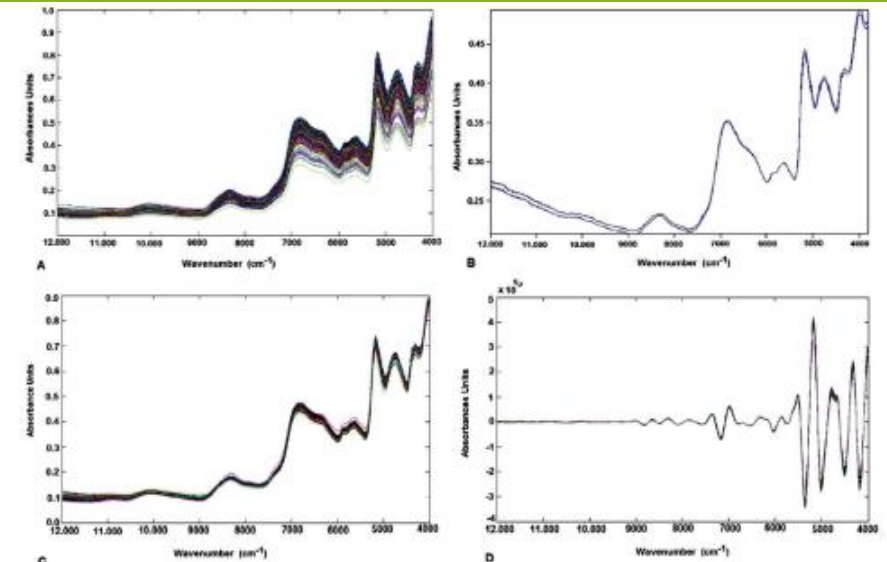
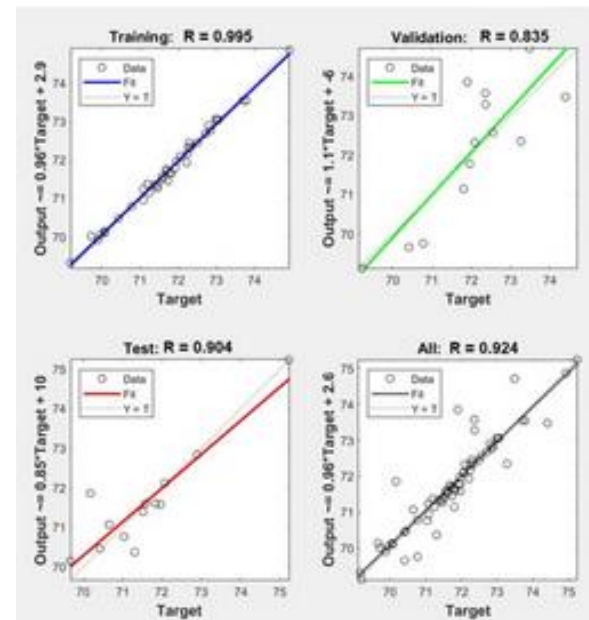
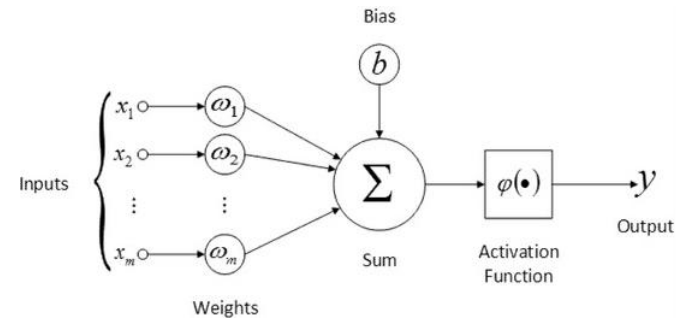
Integrative Advances in Rice Research

Edited by Min Huang

[Book Details](#) | [Order Print](#)

Chapter12. Near-Infrared Spectroscopy and Machine Learning: Analysis and Classification Methods of Rice

NIR coupled with machine learning technology is a fast and accurate tool for better assessment of rice classification and authenticity purposes.



Rice NIR spectra data without treatment (A) and after pre-processing procedure: baseline correction (B, C) and first derivative process (D).

DNA-based methods in rice certification

20 SELECTED VARIETIES:



Seed germination in hydroponics in Yoshida medium



DNA isolated from leaves (CTAB method)

Seeds homogenized with CryoMill or coffee grinder



DNA isolated from seeds (CTAB method)

- Arborio
- Ulisse
- Ronaldo
- Ariete
- Giza 181
- Arelate
- Caravela
- Super Basmati
- Maçarico
- J. Sendra
- Gageron
- Manobi
- Carnaroli
- Elettra
- Teti
- CL-28
- Giza 177
- Albatroz
- Lusitano
- Basmati type III



Already sequenced by TRACE-RICE (Whole-Genome)

Bioinformatic analysis of the 20 genomes, plus 2 included in the TRACE-RICE studies (previously sequenced)

Being sequenced

Bomba and Puntal



Identification of polymorphisms and design of a functional detection method



Inovative Rice-based Foods

<https://issuu.com/graosbrasil/docs/granos142online>

Rice: Innovations in a traditional cereal



DIVERSIFICATION OF QUALITIES AND PRODUCTS

- Healthy and tasty food
- Side streams valorisation



Different strategies were identified that are currently being tested to increase the functionality of rice and their bioactive compounds such as germination, fermentation, physical and enzymatic treatments

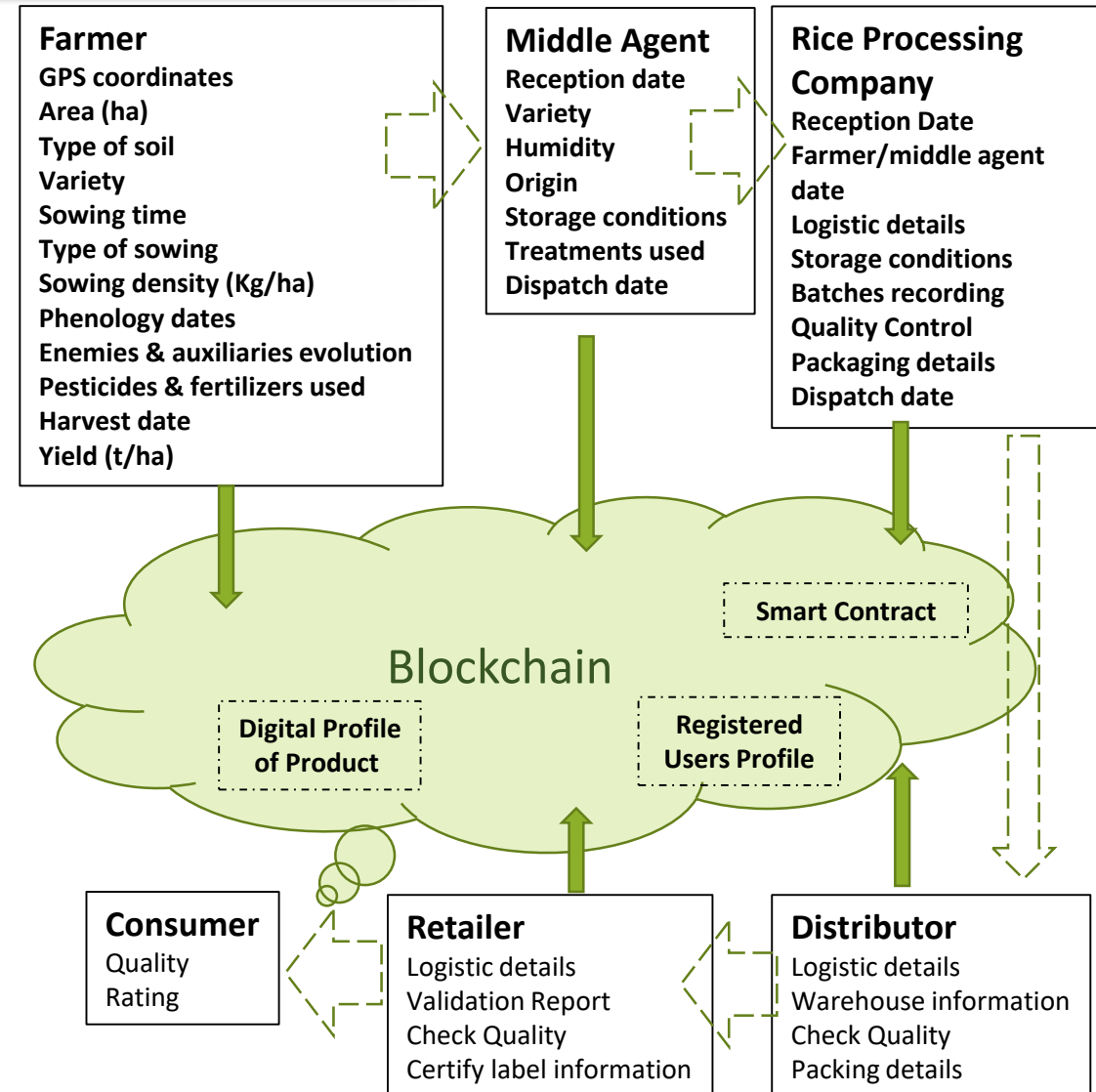
Blockchain technology in rice traceability

Several issues on the rice value chain:

- A lack of transparency and traceability leads to frauds, contractual breaches and insurance claims
- Documents need to be checked and matched manually
- Higher costs on traceability and control

Solution:

Develop a software-as-a-service (SaaS) solution, supported on blockchain technology, that allows for rice products to be traced and tracked throughout the whole value chain



thank you!

Trace
RICE

Carla Brites

<http://trace-rice.eu/>

