

Nutritional Profile of Ancestral Wheat Varieties (*Triticum spelta*) and Bakery Products Obtained Under Organic Agriculture in Argentina.

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INTRODUCTION

- ▶ The definition of *Triticum spelta* L. was incorporated into the Argentine Food Code (CAA) in 2017.
- ▶ Organic food production information in Argentina, needs to be addressed through workshops, publications and networking between all actors across agro-value chain with the aim to increase the impact of the support provided.

OBJECTIVES

- ▶ Evaluate the nutritional profile of **the only two organic whole spelt flours available at the market in Argentina.**
- ▶ Compare their performances with a whole wheat bread flour (*Triticum aestivum*) of high industrial quality.

MATERIALS & METHODS

Spelt wheat “Dinkel ECOFAUNO” (DK) and “Oberkulmer ROTKORN” (OR) varieties were cultivated and certified under the organic farming conditions between 2018-2019 years in the Wheat Subregion IV Argentina.

The samples of two spelt with different granulometry and whole wheat varieties were analysed for:

- ▶ **Ash, Moisture, Falling Number, Protein, Crude Fat & Fiber, Rheological Parameters as well as Bakery Products.**

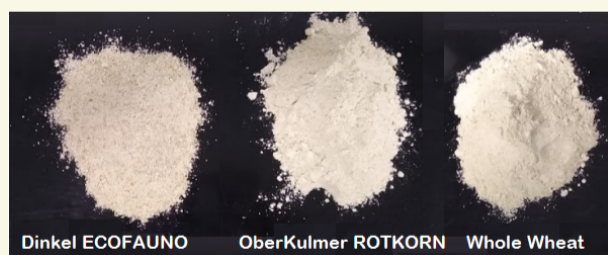


Figure 1: Wholemeal flours used for this study.

RESULTS & DISCUSSION

- ▶ The results for both spelt varieties indicated that ash values were less than 2.30g/100g and moisture less than 15.5g/100g as established by CAA.

Whole Flours	% Ash	% Moisture	FN
DINKEL Ecofauno	2,241 b	13,18 b	321 b
OberKulmer ROTKORN	2,345 a	13,34 a	332 b
Whole Wheat	1,960 c	13,00 c	383 a

Table 1: Average values of % of Ash, Moisture, Falling Number

RESULTS & DISCUSSION

- ▶ DK presented statistically different values of Crude Fat and Crude fiber compared to OR. The analyzed minerals showed similar concentrations, with higher Phosphorus and Sodium content in DK.

Whole Flours	% N	%Protein	%Crude Fat	%Crude Fiber
DINKEL Ecofauno	2,1983 a	12,53 a	2,4463 b	1,3788 a
OberKulmer ROTKORN	1,7136 c	9,77 c	1,9780 a	1,4624 a
Whole Wheat	1,9910 b	11,35 b	2,1414 c	1,4406 a

Table 2: Average values of Nitrogen, Protein, Fat and Fiber.

- ▶ Statistically significant differences were observed among the three flours in gluten quality, baking strength, tenacity and extensibility ratio and farinographic characteristics. In DK, the wet and dry gluten content were the highest and showed significant differences with respect to the other flours.

Whole Flours	% Gluten			Alveograph			Farinograph		
	Wet	Index	Dry	W	P/L	WA	DTT	DS	FU
DINKEL Ecofauno	24,8 a	95 b	9,0 a	107 b	3,26 b	55,0 b	5,70 b	7,8 a	62 a
OberKulmer ROTKORN	21,1 b	93 c	7,5 b	86 c	2,22 c	55,5 b	2,77 c	3,5 c	91 b
Whole Wheat	20,6 b	98 a	7,2 b	183 a	4,30 a	67,8 a	7,13 a	5,3 b	114 a

Water Absorption (WA), Dough development time in minutes (DDT), stability of dough in minutes (DS), and dough softening after 12 min in FU.

Table 3: Average values of rheological properties.

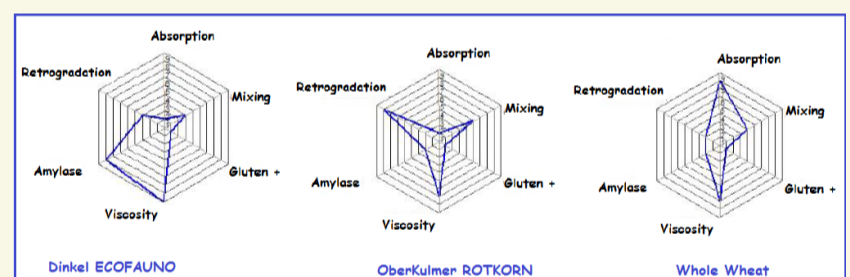


Figure 2: Mixolab results for all whole flours.

- ▶ Spelt breads and Cookies were compared with whole wheat flours products.

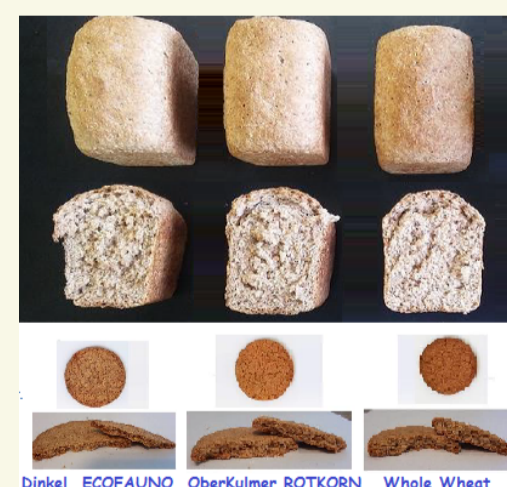


Figure 3: Spelt and whole wheat bakery products.

CONCLUSION

These results suggested that spelt whole flours were being more suitable for making cookies and other bakery products providing carbohydrates, high protein quality, and minerals. To consolidate this investigation more studies need to be performed.