

Supplementary materials

S1. Examples of coding

Figure S1 provides examples of the coding of the products. In the first example, (a) Parmigiano Reggiano PDO, regarding the nutritional dimension, given the indication of ingredient and nutrition labeling, including nutritional claims (high in calcium and protein), the overall nutrition score was 100. The total naturalness score was 60 as it indicated preservative-free, lactose-free, and without other (i.e., 100% natural). The total quality score was 20, since it only showed the period of cheese ripening in months that was then registered for further analysis. Because there were PDO and Parmigiano Reggiano consortium labels and a storytelling component (a picture of a landscape), the overall tradition score was 50. Texture, aroma, taste, and note of degustation were all acknowledged, giving the sensory evaluation a total score of 80. The total sustainability score was 0. In the second example, (b) Grana Padano PDO, the total nutrition score was 66, as it indicated ingredient and nutrition labeling. The overall score for naturalness was 0. With only the cheese's ripening (12 months) stated, the overall quality score was 20. The total tradition score was 50, as there were PDO and Grana Padano Consortium authorization labels and storytelling elements (a picture of the product). Given that we could see the product's color, the overall sensory score was 20. Due to the presence of the EU biological logo, the overall sustainability score was 25.



Figure S1. Examples of coding of (a) Parmigiano Reggiano PDO and (b) Grana Padano PDO labels.

S2. Frequency of dimensions and subdimensions on the products

Table S1 lists all dimensions determining the degree of quality, tradition, sensory, naturalness, sustainability, and nutrition aspects and their frequency of occurrence on the products, both in absolute and relative terms. The absolute frequency indicated whether each dimension or sub-dimension appeared on the labels. The relative frequency indicated how frequently each dimension or sub-dimension appeared on the labels of each product type.

Table S1. The frequency and relative frequency (%) of occurrence of different dimensions reflected on the labeling of the products.

Variables	Parmigiano Reggiano PDO (n=87)		Grana Padano PDO (n= 152)		Roccamerano PDO (n=18)		robiola type (n =94)		Caciocavallo Silano PDO (n=31)		caciocavallo type (n =37)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
QUALITY	87	100.0	109	71.2	11	61.1	30	31.9	7	22.6	6	16.2
<i>Cheese ripening</i>	85	97.7	101	66.0	0	0	0	0	0	0	0	0
<i>Indicated Quality</i>	28	32.2	49	32.0	11	61.1	30	31.9	7	22.6	6	16.2
Cow breed Specification	9	10.3	0	0.0	2	11.1	0	0	0	0	3	8.1
Mountain Product	5	5.7	2	1.3	1	5.6	1	1.1	0	0	0	0
Reserve, Premium	1	1.1	32	20.9	0	0	0	0	0	0	0	0
Other Quality	20	23.0	26	17.0	10	55.6	29	30.9	7	22.6	3	8.1
TRADITION	79	90.8	137	89.5	18	100	86	91.5	21	67.7	7	18.9
<i>Geographical origin</i>	76	87.4	137	89.5	18	100	55	58.5	18	58.1	3	8.1
PDO label	76	87.4	137	89.5	18	100	0	0	18	58.1	0	0
Material origin	6	6.9	5	3.3	10	55.6	55	58.5	8	25.8	3	8.1
<i>Artisan aspect</i>	77	88.5	137	89.5	8	44.4	9	9.6	17	54.8	3	8.1
Consortium authorization label	77	88.5	137	89.5	8	44.4	0	0	17	54.8	0	0
Keywords of Artisan	4	4.6	14	9.2	0	0	9	9.6	1	3.2	3	8.1
<i>Foundation year</i>	13	14.9	18	11.8	0	0	9	9.6	10	32.3	1	2.7
<i>Storytelling</i>	42	48.3	64	41.8	14	77.8	79	84	2	6.5	3	8.1
SENSORY	75	86.2	133	86.9	10	55.6	47	50	31	100	37	100
Indication on Color	62	71.3	129	84.3	10	55.6	42	44.7	31	100	37	100
Indication of Texture	11	12.6	4	2.6	0	0	4	4.3	0	0	0	0
Indication of Aroma	15	17.2	4	2.6	0	0	0	0	0	0	0	0
Indication of Taste	21	24.1	5	3.3	0	0	3	3.2	0	0	0	0
Notes for degustation	23	26.4	6	3.9	0	0	6	6.4	0	0	0	0

Table S1 (continue).

Variables	Parmigiano Reggiano PDO (n=87)		Grana Padano PDO (n= 152)		Roccamerano PDO (n=18)		robiola type (n =94)		Caciocavallo Silano PDO (n=31)		caciocavallo type (n =37)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
NATURALNESS	49	56.3	46	30.1	0	0	12	12.8	0	0	0	0
Without additives	14	16.1	0	0.0	0	0	0	0	0	0	0	0
Preservative-free	39	44.8	0	0.0	0	0	10	10.6	0	0	0	0
Lactose-free	46	52.9	40	26.1	0	0	0	0	0	0	0	0
Gluten-free	0	0.0	0	0.0	0	0	2	2.1	0	0	0	0
Without other ^b	35	40.2	6	3.9	0	0	2	2.1	0	0	0	0
SUSTAINABILITY	11	12.6	13	8.5	8	44.4	5	5.3	0	0	0	0
Organic logo	5	5.7	6	3.9	0	0	2	2.1	0	0	0	0
Generic sustainability	5	5.7	3	2.0	0	0	0	0	0	0	0	0
Animal welfare	0	0.0	3	2.0	8	44.4	1	1.1	0	0	0	0
Sustainable packaging	6	6.9	1	0.7	8	44.4	2	2.1	0	0	0	0
NUTRITION	81	93.1	149	97.4	18	100	91	96.8	23	74.2	25	67.6
Ingredient labelling	81	93.1	149	97.4	18	100	89	94.7	23	74.2	25	67.6
Nutrition labelling	77	88.5	130	85.0	12	66.7	67	71.3	20	64.6	6	16.2
Others	26	29.9	6	3.9	0	0	0	0	0	0	0	0

Source: Authors own work

S3. Correlation among different dimensions, prices, and products

Table S2. Means, standard deviation and correlation among the dimensions and cheese prices.

Variables	M	SD	Price	D1: Quality	D2: Tradition	D3: Sensory	D4: Naturalness	D5: Sustainability
Parmigiano Reggiano PDO (n = 87)								
Price (euro/kg)	24.2	6.20						
D1: Quality	27.6	12.66	.435**					
D2: Tradition	39.2	20.72	.400**	.337**				
D3: Sensory	30.3	24.56	.465**	.238*	.347**			
D4: Naturalness	30.8	30.62	.447**	.182	.369**	.555**		
D5: Sustainability	4.6	12.94	.516**	.317**	.282**	.160	.284**	
D6: Nutrition	70.1	26.21	.220*	.051	.548**	.486**	.571**	-0.056
Grana Padano PDO (n = 153)								
Price (euro/kg)	16.4	3.20						
D1: Quality	21.0	17.44	.395**					
D2: Tradition	37.3	19.92	.186*	.100				
D3: Sensory	19.3	12.44	.041	.112	-0.047			
D4: Naturalness	6.0	9.20	.043	.190*	.266**	-0.149		
D5: Sustainability	2.1	6.99	.364**	.090	.371**	-0.060	.158	
D6: Nutrition	61.5	16.62	.208**	.169*	.598**	-0.122	.295**	0.083
Roccamare PDO (n = 18)								
Price (euro/kg)	25.4	5.56						
D1: Quality	14.4	13.38	-0.219					
D2: Tradition	44.4	20.21	-0.030	-0.284				
D3: Sensory	11.1	10.23	.056	-0.210	.885**			
D4: Naturalness	0.0	0.00	N/A	N/A	N/A	N/A		
D5: Sustainability	22.2	25.57	.117	-0.306	.822**	.800**	N/A	
D6: Nutrition	55.0	16.01	-0.004	-0.302	.850**	.791**	N/A	.632**
robiola type (n = 94)								
Price (euro/kg)	19.9	3.99						
D1: Quality	6.4	9.37	.107					
D2: Tradition	31.9	15.40	-0.064	.343**				
D3: Sensory	11.7	14.78	-0.033	.138	.066			
D4: Naturalness	3.0	8.27	-0.315**	.140	-0.037	.028		
D5: Sustainability	1.3	5.64	.415**	.143	-0.184	-0.189	-0.086	
D6: Nutrition	54.8	17.82	-0.102	.179	.302**	.019	0.181	0.150

Table S2 (continue)

Variables	M	SD	Price	D1: Quality	D2: Tradition	D3: Sensory	D4: Naturalness	D5: Sustainability
Caciocavallo Silano PDO (<i>n</i> = 31)								
Price (euro/kg)	16.3	2.84						
D1: Quality	4.5	8.50	.078					
D2: Tradition	27.4	24.67	-0.008	.781**				
D3: Sensory	20.0	0.00	N/A	N/A	N/A			
D4: Naturalness	0.0	0.00	N/A	N/A	N/A	N/A		
D5: Sustainability	0.0	0.00	N/A	N/A	N/A	N/A	N/A	
D6: Nutrition	45.8	29.12	.009	.381*	.702**	N/A	N/A	N/A
caciocavallo type (<i>n</i> = 37)								
Price (euro/kg)	17.0	4.42						
D1: Quality	3.2	7.47	.430**					
D2: Tradition	4.7	11.16	0.318	.643**				
D3: Sensory	20.0	0.00	N/A	N/A	N/A			
D4: Naturalness	0.0	0.00	N/A	N/A	N/A	N/A		
D5: Sustainability	0.0	0.00	N/A	N/A	N/A	N/A	N/A	
D6: Nutrition	27.6	22.70	-0.064	.538**	.600**	N/A	N/A	N/A

Note. Pearson correlation. * indicates $p < 0.05$, ** indicates $p < 0.01$. M and SD are used to represent mean and standard deviation respectively. N/A means non applicable.

Source: Authors own work