

Labels of Traditional Food Products from Southeastern Morocco and Consumer Usage

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Abstract: Food products labeling is a way to ensure that consumers have complete information to protect their health and their interests. This paper investigates Food Labels (FL) compliance with standards, and consumers that have interest in Traditional Food Products (TFP) in three sale areas (Casablanca, Meknes, Erfoud) in Morocco. Structured questionnaires were administered, randomly, to thirty-five professional organizations, producing TFP in Tafilalet region to evaluate their FL. Also, 456 consumers have been interviewed in TFP sale areas to evaluate their satisfaction. The results were analyzed by IBM SPSS Statistics 24.0 software. The results of this investigation show that, in Tafilalet region, TFP does not, largely, meet the guardianship standards. Respondents at different age groups are interested in TFP, with a higher interest among young people (21 – 40 years old). The first three mention that consumers usually read are: product name (78.3%), list of ingredients (47.1%) and the expiration date (60.3%). 75.5% say that they are satisfied with the information found, but 48.1% wanted more, especially ingredients' characteristics, energy content, and the origin of the manufacturer. Considering the importance of the TFP, this study highlights the FL and the consumers' expectations in Morocco.

Keywords: Food Labeling; Traditional Food Products; Consumer satisfaction; Moroccan consumers

1. Introduction

The market of food products is very rich of fresh and pre-packaged food products, which let consumers ahead of daily decisions to choose better what is appropriate for them. In addition, the quest of healthier eating raises the demand for more detailed, accurate and accessible information on food safety, quality, covering nutritional content, ingredients and health claims (Ali *et al.*, 2009). Food label (FL) is every sign, mark, printed graphic or written information on food package (Glanz *et al.*, 1989; Wandel 1997; Lin *et al.*, 2004; Lobstein *et al.*, 2009). According to Grunert *et al.*, 2007; Prinsloo *et al.*, 2012 and Van der Merwe *et al.*, 2014, it seeks to justify differences between products from the same category

Labeling is mandatory and must comply with regulations, national and international laws, to control mandatory and optional mentions. These mentions must include information about: product identity (trade naming, ingredients...), its safe use (UBD, BBD, manual...), and its nutritional characteristics. These statements help to protect the consumers against food poisoning (Sanlier *et al.*, 2010), allergic reactions, when they are sensitive (Voordouw *et al.*, 2009), or to balance their diet (Rothman *et al.*, 2006; Grunert *et al.*, 2007; Azucena *et al.*, 2016).

Traditional Food Products (TFP) are defined by two main components: the territory of origin and the authenticity (Guerrero *et al.*, 2009). They are always known and appreciated by consumers in a higher level compared to conventional food products (Guerrero *et al.*, 2010; Vanhonacker *et al.*, 2010a; Vanhonacker *et al.*, 2010b).

This higher appreciation is usually due to the nostalgic emotion that consumers have towards this kind of product (Guéguenet *et al.*, 2012; Sosa *et al.*, 2014), or the fact that they are, generally, known for their health benefits (Van der Merwe *et al.*, 2014), use in diet, or just for their taste (Glanz

et al., 1998; Gracia, *et al.*, 2008; Van Loo *et al.*, 2010; Paul *et al.*, 2012; Bernard *et al.*, 2017).

Internationally, Codex Alimentarius sets several standards about food such as codex 1-1985: general standard for the labeling of prepackaged foods. At the national level, after the 25-06 and 28-07 Act, the government approve the Decree N°. 2-12-389 of 11 Jmada II 1434 (22 April 2013) laying down the conditions and arrangements for the labeling of foodstuffs. In 2016, the Order N°. 281-16 of 21 Rabii II 1437 (1 February 2016) has been approved, laying down the requirements and the detailed rules for the indication of nutrition information in the labeling of prepackaged foodstuffs. Together with the Order n°2-10-437 of Chaoual 1432 (6 September 2014) taken for the application of certain provisions of the Act. n° 28-07 of food safety (BO No. 5984 of 6 October 2011).

Locally, purchase and consumption of TFP is still linked to specific areas where the product is well-known. It is still rare to find TFP in big cities or large sale areas although the demand is increasing (Kuznesof *et al.*, 1997; Skuras and Dimara, 2004). For this reason, the second pillar of PMV (Plan Maroc Vert) focus on the development and the promotion of these products.

The aim of this study is to evaluate TFP Labeling, in Tafilalet region, the profile of consumer interested in TFP, the most read and searched information on a FL and their satisfaction. For these reasons, two questionnaires have been filled in, one in Tafilalet region, the other in three sales areas of TFP. The survey was conducted in three periods during 2015.

2. Materials and Methods

Two questionnaires were prepared:

The first questionnaire was designed to evaluate prepackaged TFP labels on the basis of Codex Stan 1-1985

and Decree N°. 2-12-389. Among others, it seeks to identify the type of professional organizations working in TFP production, and to compare information of the label with the general instructions of the two regulations. It was presented to 35 different producers, randomly selected, in Tafilalet region.

The second questionnaire was handed out to consumers to assess and evaluate the significance of entries appearing on the FL, the satisfaction rate, and their expectations as consumers. Questions were prepared to give a general view of respondent, socio-demographic profile, the first three mentions usually read, the three mentions judged the most important, and the three entries to require. It was presented to 456 consumers in three places: MarocTaswiq at Casablanca between May and June 2015, SIAM Meknes (Salon Internationale d'Agriculture de Meknès) 2015 between April 29th and May 3^{ed}, and SIDATTE Erfoud (Salon International des dates à Erfoud) between October 29th and 1st of November 2015.

The results were analyzed by IBM Statistical Package for the Social Sciences 24.0 software.

3. Results and Discussion

3.1 TFP labeling

The survey results of 35 professional organizations product show that both associations (57,14%) and cooperatives (42,86%) work on TFP production and sale, as well as some Economic Interest Grouping (Fahim *et al.*, 2016) (EIG results are not included).

From table 1, we can see a lack of information at several levels. This lack of compulsory mentions in FL can be a misleading to consumers at purchasing, or a real danger to public safety.

Table 1: Information mentioned and not mentioned on FL of TYP produced by associations and cooperative

Information	Association		Cooperative		Total	
	Mentioned	Not Mentioned	Mentioned	Not Mentioned	Mentioned	Not Mentioned
%A	0	100	0	100	0	100
%I	0	100	0	100	0	100
DS	5	95	33,3	66,7	17,1	82,9
IP	0	100	0	100	0	100
LA	0	100	0	100	0	100
LI	25	75	60	40	40	60
LN	0	100	13,3	86,7	5,7	94,3
Ma	30	70	45,7	53,3	37,1	62,9
Nw	75	25	93,3	6,7	82,9	17,1
PD	55	45	93,3	6,7	71,4	28,6
PN	80	20	100	0	88,6	11,4
PtN	95	5	100	0	97,1	2,9

%A= “% of additives”, %I= “% of Ingredients”, DS= “Date stamp”, IP= “Ingredients properties”, LA= “List of food additive”, LI= “List of ingredients”, LN= “Lot number”, Ma= “Manual”, Nw= “Net weight”, PD= “producer details”, PN= “Producer name”, PtN= “Product name”

The percentage of additives, the percentage of ingredients, the ingredient's properties, and the list of food additives are totally ignored by producers. Absence of information such as the name of the product (2,9%) or the producer (11,4%), the net weight (17,1%), the product use instructions (62,9%) may disturb consumers (ANIA & IFN 2010); but others, like UBD/BBD (82,9%), ingredient list (60%), additives (100%) and lot number (94%) can cause serious health problems (poisoning, allergies, ...).

Several research works state that consumers look for full-labeled food (Cowburn and Stockley, 2005; Grunert and Wills, 2007; Campos *et al.*, 2011; Lahti-Koski *et al.*, 2012; Sinne 2017); so, any lack of information affects the purchasing.

In our case study, TFP (date jam, date paste, vinegar, couscous, olive oil, honey, aromatic and medicinal plants...) from Tafilalet region, usually composed of one or two ingredients, the list or the percentage of ingredients cannot be mentioned (Codex Stan 1-1985; Decree No. 2-12-389).

Table 2: Socio-demographic profile of respondents

Gender	Frequency	Percentage (%)
Male	203	44,5
Female	253	55,5
Age Range (years)		
Under 20	32	7
21 to 30	137	30
31 to 40	128	28,1
41 to 50	91	20
More than 51	68	14,9
Education Level		
None	20	4,4
High School	104	22,8
University Student	241	52,8
Higher Education	91	20
Work		
*None	53	11,6
Student	62	13,6
Employee	118	25,9
Senior	211	46,3
Retired	12	2,6

*The unemployed are usually housewives or stay at home mothers

We can conclude that in this region TFP are, generally, produced by associations and cooperatives. These last have more advantages in comparison to associations, which is the case for Fahim *et al.*, 2016, they have a bit more accordance with the standard (Table 2), but they need, both, to improve their labels. They don't report the ingredient properties and the list of additives, 66,7% of cooperatives don't mention the date stamp against 94% of associations, and 60% of cooperatives' labels have the list of ingredients against 25% of associations.

3.2 Respondents profile

Our total sample is 456, of which 203 (44.52%) men and 253 (55.48%) women. Most (58.11%) are aged between 21 and 40 years old (Table 3).

All ages from 21 years old are interested in traditional food products. But the lack of younger consumers can be justified by the procurement responsibility which is mostly for the older one.

The trend of TFP diet is due to a higher consciousness for a healthier choice (Rothman *et al.*, 2006; Grunert & Wills, 2007; Van der Merwe *et al.*, 2014; Azucena *et al.*, 2016) and a return to origins (Guerrero *et al.*, 2009), because, typically, traditional products affect a nostalgic component among consumers (Elliott, 1997; Guéguenet *et al.*, 2012; Sosa *et al.*, 2014).

TFP consumers are, mostly, university students (52.9%) and 20% have a higher level of education, some of them are senior managers (46,3%), in addition to 25,9% of employees in different areas (craftsmen, producers, chefs ...), students (13,6%), unemployed (11,6%) and a few retired (2,6%), (Table 3).

Table 3: Socio-demographic characteristics and reading rate of the respondents

Characteristics	None	Rarely	Sometime	Always	Total
Label Reading					
Total	3,3%	11,6%	15,1%	70%	100%
Gender					
Male	2,4% ^a	7% ^a	7,9% ^{a,b}	27,2% ^b	44,5%
Female	0,9% ^a	4,6% ^a	7,2% ^{a,b}	42,8% ^b	55,5%
Age Range (years)					
Under 20	0,7% ^a	1,8% ^a	0,9% ^a	3,7% ^a	7,00%
21 to 30	0,9% ^{a,b}	3,5% ^{a,b}	6,8% ^b	18,9% ^a	30%
31 to 40	0,9% ^a	2,2% ^a	4,4% ^a	20,6% ^a	28,1%
41 to 50	0,4% ^a	1,8% ^a	1,8% ^a	16% ^a	20%
More than 51	0,4% ^a	2,4% ^a	1,3% ^a	10,7% ^a	14,9%
Education Level					
None*	0,7% ^a	1,1% ^{a,b}	0,2% ^b	2,4% ^b	4,4%
High School	1,5% ^a	5% ^a	3,7% ^{a,b}	12,5% ^b	22,90%
University Student	0,9% ^a	5% ^a	8,6% ^a	38,4% ^a	52,70%
Higher Education	0,2% ^a	0,4% ^b	2,6% ^{a,b}	16,7% ^a	20,00%
Work					
Unemployed*	0,2% ^a	2% ^a	1,5% ^a	7,9% ^a	11,6%
Student	0,7% ^a	2,4% ^a	3,1% ^a	7,5% ^a	13,6%
Employee	2,2% ^a	4,8% ^a	5,7% ^a	13,2% ^b	25,9%
Senior	0,2% ^a	2% ^a	3,9% ^a	40,1% ^b	46,3%
Retired	0% ^a	0,4% ^a	0,9% ^a	1,3% ^a	2,6%

*The "none" and "unemployed" are usually housewives or stay at home mothers.

Each subscript letter denotes a subset of label reading categories whose column properties do not differ significantly from each other at the 0,05. Each subscript letter denotes significantly from each other at the 0,05 level. This distribution can highlight the level of education and life of consumers who are more interested in TFP diet. We can say that they are, mostly, women and men with a high level of education and living standard. According to Teagasc, 2004; Platania and Privitera 2006 and Guerrero *et al.*, 2009, housewives or stay at home mother are the most purchasers, which is not the case in this study (11,6%).

3.3 Food Label Reading

Label intends to ensure that consumers have complete information about products they want to purchase, but they ignore or do not properly use it (Rothman *et al.*, 2006, Sanlier & Karakus 2010). 3,3% of consumers claim that they have never read a FL, and 11,6% states that they, rarely, read it, especially men (2,4% and 7%), (Table 4). According to them, they are accustomed to buying the same products, or they follow the recommendations of their relatives.

Table 4: Correlation coefficient between gender, age, education, work, and label reading

		Gender	Age Range	Education	Work	Label Reading
Gender	Pearson Correlation	1	-,111*	-0,084	-,094*	,188**
	Sig. (2- tailed)		0,018	0,074	0,044	0
Age Range	Pearson Correlation	-,111*	1	,144**	-0,021	,108*
	Sig. (2- tailed)	0,018		0,002	0,659	0,021
Education	Pearson Correlation	-0,084	,144**	1	,510**	,275**
	Sig. (2- tailed)	0,074	0,002		0	0
Work	Pearson Correlation	-,094*	-0,021	,510**	1	,166**
	Sig. (2- tailed)	0,044	0,659	0		0
Label Reading	Pearson Correlation	,188*	,108*	,275**	,166**	1
	Sig. (2- tailed)	0	0,021	0	0	

*Correlation is significant at the 0.05 level (2-tailed)

*Correlation is significant at the 0.01 level (2-tailed)

Either they read the FL or not, we cannot be sure of the use of the information they find, as Grunert and Wills 2007 reported, the reading and using of FL are, conceptually, different, but respondents gave their answers on a self-reported basis. So, we can say that reading and using FL, probably, address the same thing. So, almost, 15% (14,9%) don't use, never or rarely, FL information (Table 4) against 85,1% of users, sometimes or always. According to Mannell *et al.*, 2006, the non-use of food labels may be attributed to a lack of interest or understanding of the information on the FL.

A total of 70% of respondents say that they "Always" read the FL. They are, mostly, women (42,8%), aged between 31 and 40 years old (20,6%), educated to a university level (38,4%) and senior workers (40,1%). These results rhyme with findings of Borra, 2006; Misra, 2007; Miri *et al.*, 2012; Kimberly *et al.*, 2013; Campos *et al.*, 2011 and Yong Kang, 2015.

The "label reading" or the label use is correlated, positively, to "age range", significantly, at 0.05 (Table 5). Young people (21 to 40 years old) seem to be the most interested in FL. Some research papers specify that as age increases, the probability of using nutritional labels decreases (Kim *et al.*, 2001a, 2001b) while Govindasamy & Italia, 1999; Drichoutis, *et al.*, 2005; Satia *et al.*, 2005; Misra, 2007 found the opposite. But, we can't ignore the effect of age on label use (Nayga, 2000), which might be insignificant.

Educated people were found more interested in FL, and "educational level" was found, significantly, correlated to label use at 0,01 (Table 5). The same result was reported by Guthrie *et al.*, 1995; Nayga, 1996; Nayga *et al.*, 1998; Kim *et al.*, 2001a; McLean-Meyinsse 2001; Cowburn & Stockley, 2005; Drichoutis *et al.*, 2005; Satia *et al.*, 2005 and Grunert & Wills, 2007. Even so, Nayga 2000, states the opposite.

Table 5: The top three "read" and "important" mentions on FL by the respondents

	Reading			Important		
	1 st mention to read in (%)	2 nd mention to read in (%)	3 rd mention to read in (%)	1 st important mention in (%)	2 nd important mention in (%)	3 rd important mention in (%)
%A	0	0	0	1,8	9	1,8
%I	0	0,9	0	0	11,4	1,8
DS	2,2	13,2	60,3	3,3	14,9	50,4
IP	4,6	5	8,3	8,1	7,9	3,3
LA	0	10,1	8,8	3,3	11,4	2,0
LI	3,8	47,1	8,8	22,8	21,5	4,4
LN	0	0	0	0,9	0	0,9
Ma	1,8	8,6	9,9	0	11,2	13,6
Nw	0	0	0	3,3	4,6	21,9
PD	1,3	5,3	3,1	0	3,5	0
PN	0	8,8	0,9	0,9	4,6	0
PtN	78,3	0,7	0	55,7	0	0

%A= "% of additives", %I= "% of Ingredients", DS= "Date stamp", IP= "Ingredients properties", LA= "List of food additive", LI= "List of ingredients", LN= "Lot number", Ma= "Manual", Nw= "Net weight", PD= "producer details", PN= "Producer name", PtN= "Product name"

The "work", also, affects label reading (significant at 0,01). Almost 50% of label users are seniors (Table 5). Drichoutis *et al.*, 2005, specifies that employment has a positive impact on FL reading, but Nayga *et al.*, 1998 and Nayga 2000 state the opposite.

In our case, if we can, implicitly, relate employment to income, we might say that employment, as income level, affects label use, which is, also, the case for Kim *et al.*, 2001a; McLean-Meyinsse, 2001; Cowburn & Stockley, 2005; Drichoutis *et al.*, 2005.

3.4 Food Label mentions

According to respondents (Table 6), the most three read entries are: name of product (78.1%), list of ingredients (45.6%), date stamp and storage instructions (56.1%). At the same arrangement, but with different percentages, they are the most important indications that they wish to find on a label (48.2%, 21.9% and 50%). As it is stated by Annunziata *et al.*, 2011, Consumer takes into account food label depends on the importance attached to label information. Usually, they see FL as providing useful information, with expiry date and the producer information being the most important (Ali & Kapoor, 2009).

Table 6: Correlation coefficient between gender, age, education, work, label reading and the three first mentions to read and important to find

		1 st mention to read	2 nd mention to read	3 rd mention to read	1 st mention to read	2 nd mention to read	3 rd mention to read
Gender	Pearson Correlation	0,036	-,122*	-,144*	-,156**	-,222*	-,323**
	Sig. (2- tailed)	0,439	0,009	0,015	0,001	0	0
Age Range (years)	Pearson Correlation	-,154**	0,068	0,016	-,170**	-,155**	,159**
	Sig. (2- tailed)	0,001	0,147	0,734	0	0,001	0,001
Education Level	Pearson Correlation	-,221**	0,032	0,004	-,128**	-,127**	-0,007
	Sig. (2- tailed)	0	0,493	0,93	0,006	0,007	0,886

Work	Pearson Correlation	-,177*	-0,035	0,042	-0,076	-,101*	0,03
	Sig. (2- tailed)	0,012	0,457	0,373	0,107	0,032	0,522
Label Reading	Pearson Correlation	-,233*	,158**	0,073	-0,086	-0,073	-,104*
	Sig. (2- tailed)	0	0,001	0,121	0,065	0,122	0,027

*Correlation is significant at the 0.05 level (2-tailed)

*Correlation is significant at the 0.01 level (2-tailed)

Other important information to find are: the percentage of ingredients, the list of food additives and the manual. In general, respondents say that when they don't find this "important" information, they usually don't buy the product, others report that even if they don't read it at purchasing, they take time to read it later, so even if they don't read it at first, they judge it important to find, as Cowburn and Stockley, 2005, Grunert *et al.*, 2007, Campos *et al.*, 2011, Lahti-Koski *et al.*, 2012 and Sinne, 2017 reported, consumers have preferences for full-labelled products.

3.5 Consumer satisfaction by FL's information:

Table 8 shows that 57.5% of respondents are satisfied with information found on FL, against 48,5% who said that they want more, to better buy their food, and 28.9%, who do not want to add or change current labels.

Table 7: Respondents satisfaction rate of TFP label's

Characteristics	Percentage %
Are you satisfied with the information you find on your FL	
Yes	57,5%
No	42,5%
Would you want to find more information on your FL	
Yes	48,5%
No	51,5%
What type of information do you want to add?	
Clear food label	23%
More information	48,1%
Nothing	28,9%

Satisfaction rate (table 7 & 8) goes with age and education level ($p < 0.01$), the demand of more information is factor of gender and education level ($p < 0.01$), and the type of demanded information is, significantly, correlated to age and education ($p < 0.01$), and to work ($p < 0.05$).

Table 8: Correlation coefficient between gender, age, education, work, label reading and satisfaction rate

		Are you satisfied with the information you find on your FL	Would you want to find more information on your FL	Type of information that you want to add?
Gender	Pearson Correlation	-,351**	,524**	0,055
	Sig. (2- tailed)	0	0	0,239
Age Range (years)	Pearson Correlation	-,166**	0,024	,356**
	Sig. (2- tailed)	0	0,61	0
Education Level	Pearson Correlation	-,286**	,158**	,214**
	Sig. (2- tailed)	0	0,001	0
Work	Pearson Correlation	-0,016	0,028	,097*
	Sig. (2- tailed)	0,727	0,553	0,039
Label Reading	Pearson Correlation	-,224**	,222**	,137**
	Sig. (2- tailed)	0	0	0,003

*Correlation is significant at the 0.05 level (2-tailed)

*Correlation is significant at the 0.01 level (2-tailed)

The information represented on FL are inspired by supervisory law, but changes in food habits, make people look for food with specific characteristics to make nutritious serving (Sanlier&Karakus, 2010) or to meet their dietary needs (Singla, 2010), so they need to find all necessary information to better decide.

These laws regulate not only the type of information on FL, but, also, the language and print size. According to our survey, 23% of consumers say that TFP Labels are not clear. Desired clarity is not only in writing and printing size but also in words and signs.

For those who answered that they want "more information" (48.1%), they sometimes, ask for the meaning of some current mention, or ask to add more details about other mention. They are, mostly, younger than those who demand clear label, which is the same case for Jasmina *et al.*, 2011.

Information that respondents want to add are mainly: characteristics of ingredients, virtues and uses, calories number or energy values, limit of use after opening, storage

instructions, and the origin of products (cooperative or association that manufactures the product).

The demand of clear label, is, mostly, for easy words to better understand signs, logos and quality labels meaning, or bold letter, especially when they purchase small packages, but if the label is incomplete, they seek the information gaps.

Using quality label in Morocco is still new, so consumers are dialing with new logos (AB, IGP, AOP...), for our case, TFP are usually found in limited sale areas with people to whom you can ask for more information, but it's still not enough for consumers to understand or to be convinced to buy.

4. Conclusion

This work was conducted to have a first look on TFP labeling and consumer usage, especially in Moroccan southeastern region. The first survey, was conducted in Tafilalet region, where FL from 35 producers of local TFP were analyzed. The results show a lack of essential

information mandatory by law. Some information like the list and percentage of ingredient, list of additives may not be mentioned when the product has one or two components, but the absence of UBD/ BBD and lot number is a serious danger to public health.

The second survey was conducted in 3 locations during 3 periods throughout the year 2015, by a structured questionnaire. The study sought to evaluate TFP's purchasers and their satisfaction of information they find on FL. Results have shown that traditional food diet is, mostly, a choice of women and men over 21 years old with a major standard of living and education. But the lack of certain information on FL put consumers in difficult choice, especially with diet, that asks for complete information. The requested information are at first clarity (size and vocabulary), characteristics of ingredients, virtues, energy values, limit of use after opening, and origin.

This work gives a first look to label's usage among Moroccan consumers. But, given the differences between consumers and diversity of TFPs, more research is needed to be conducted to determine if similar results will be found across the country.

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