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## Categorical distribution of food safety constraints in Moroccan companies

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### ABSTRACT

*In this study we have analyzed deeply results obtained in our manuscript titled: Food safety constraints analysis in Moroccan food industry - focus on documentation. The aim is to have a categorical distribution of answers received and to make comparison between categories. Results show that Processing 3 category in the most present in the sector with 28% of all companies requested. Answers of each question differ from a category to another. Even the majority of categories confirmed the disposal and the updating of information relative to food safety (regulation, product standards and guides), answers of questions 9 and 10 of the questionnaire show the contrary.*

**Key words:** Certified food companies, Exporting companies, Food regulations, Moroccan food industry, GMP - GHP - GLP, Product standards, Questionnaire, Software quality / food safety management.

### INTRODUCTION

Food industry remains a strategic sector in Morocco because of its economic, social and environmental crucial role. In fact, this sector contributes on average 16% of GDP through its upstream agriculture and 4% of its food-industrial downstream, for nearly 10% to total exports and 44% of employment. Agriculture is also responsible for valorization and conservation of natural resources of our country (land and water) [1]. To support the growth of the Moroccan food industry, the government is implementing a program to develop Food-Industrial Platforms (6 agro-food poles) and seafood processing (2 Fish Hub), providing infrastructure and services at the best international standards [2]. Over the period 2009-2011, Moroccan food exports were heavily concentrated to the European Union market, which has absorbed about 73% of it. Among importers we note France which leads with nearly 50%. The evolution of EU part from food industry exports informs about its dominance despite the obstacles placed for access to this market. Indeed, this part has almost remained unchanged all over the last decade above 70%. The high concentration of exports to the European market has made Morocco very vulnerable to the changing economic conditions of the European Union [3]. Food safety has become a concern subject for health services, inspection services and consumer [4]. Delivering safe food to consumers is the responsibility of operators at all levels of food production chain [5].

### MATERIALS AND METHODS

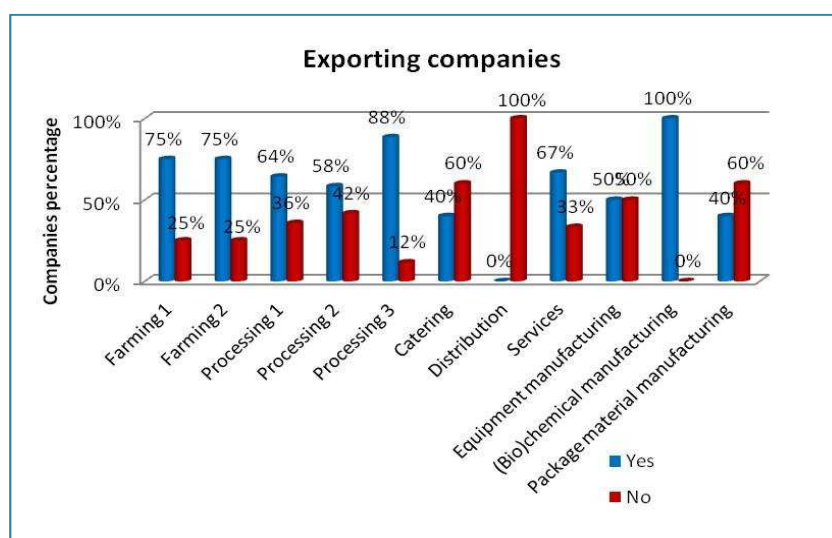
In this study we have deeply analyzed results of work publish by [6] with use of ISO 22003 version 2007 standard annex 1: Classification of food chain categories [7]. This annex allows classifying food chain companies according to their activities to 13 categories.

### RESULTS AND DISCUSSION

In table 1, companies that responded to the questionnaire are dispatched by category.

**Table 1: Repartition of answers of the questionnaire by categories of food industry**

Category	Category's Responses	% of category
A Farming (Animals)	4	4%
B Farming (Plants)	16	17%
C Processing 1	14	15%
D Processing 2	12	13%
E Processing 3	26	28%
F Feed production	0	0%
G Restoration	5	5%
H Distribution	5	5%
I Services	3	3%
J Transport and storage	0	0%
K Equipment manufacturing	2	2%
L (Bio)chemical manufacturing	2	2%
M Package material manufacturing	5	5%

**Question No 1: Are you an exporting company?****Figure 1: Percentage of exporting companies by category**

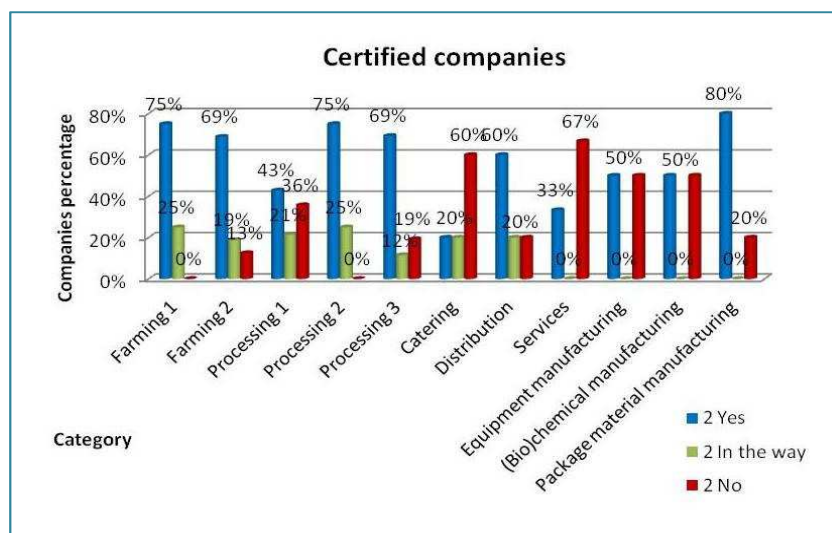
Quantitative and qualitative richness in Moroccan food tissue is reflected in the evolution of exports and imports of agriculture products and manufactured food. Numbers show that imports of food, beverage and tobacco products have recorded a decline of 14.6% between 2012 and 2013. Against exports of Moroccan food industry that increases from year to other. Between 2012 and 2013 the variation was +11% against +6.5% and +6.9% respectively between 2011/2012 and 2010/2011. Morocco recorded a coverage rate of 93.9% (value of imports / value of exports) at the food, beverages and tobacco products (knowing that for tobacco there is only imports and no exports) [8].

From figure 1 we can constate that with the exception of the two companies belonging to L category ((Bio)chemical manufacturing) which are both exporting, the percentage varies from a category to another. Enterprises of Processing 3 category have more tendency to export their product to international market. In fact, just 3 of 26 which answered the questionnaire do not exportation. For Farming 1 and 2 categories, results are equal, 75% of them are exporters. Whether in H category (Distribution) none of its enterprises is exporting. Something that can be explained by the fact that distribution of food products activity is done in local market by these companies.

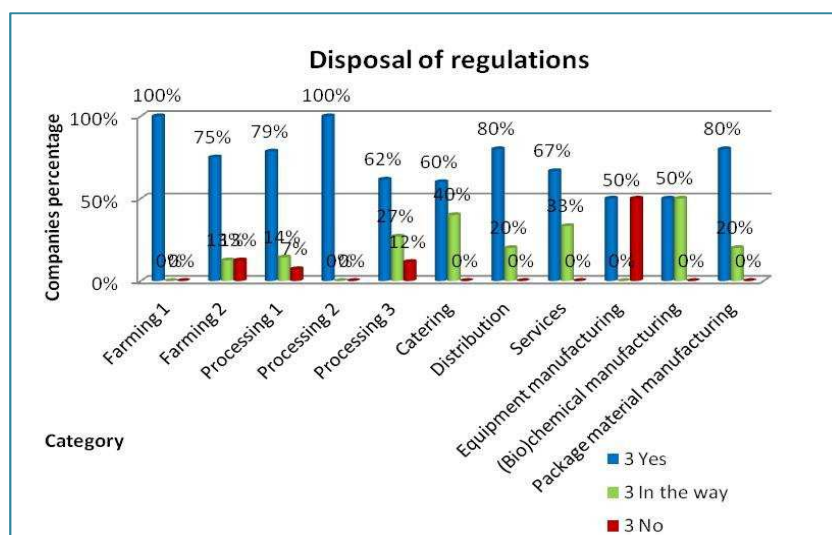
**Question No 2: Are you certified?**

In many cases, certification improves organization's management and internal functioning. It is only one of management's components. Like any improvement process, certification has a positive effect on organization profitability and productivity [9]. In fact, obtaining an ISO certification has become a popular managerial and strategic tool for businesses across the globe for more than a decade. [10].

In the case of questioned companies, we observe the in general processing enterprises, farming and packaging are the most interested by certification of their management systems and their product in view of high competition and their clients' requirements.



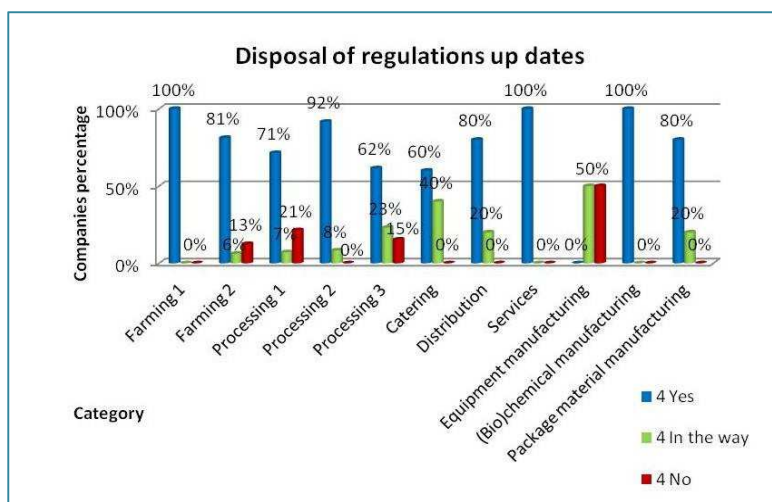
**Question No 3: Do you have all regulations related to your activity sector?**



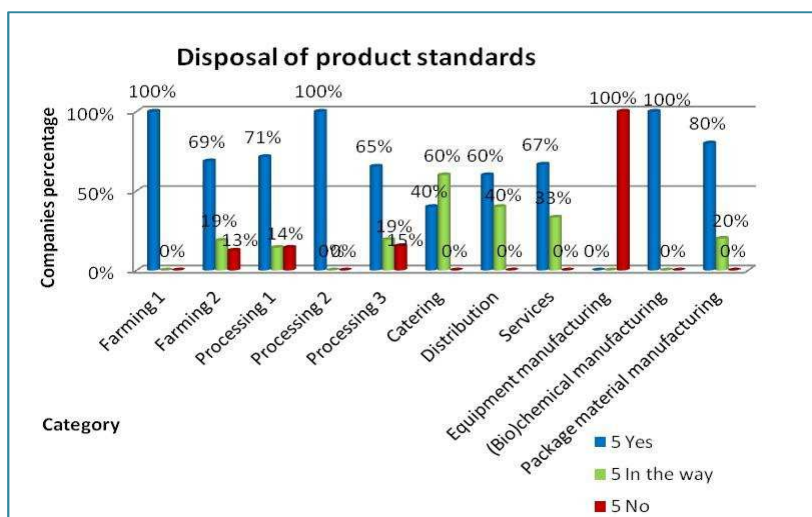
It is not evident to have 100% real answers for this question. It is not accepted to work in an activity without having all applicable regulation. Results received are in contradiction with answer of questions 9 and 10 of the same questionnaire.

**Question No 4: Made you updates of regulations on a regular basis?**

Following up-dates is necessary to ensure the use of the latest applicable regulation. Results of this question show that categories which answered « Yes » in question No 3 have also answered « Yes » or « In part » in this question.



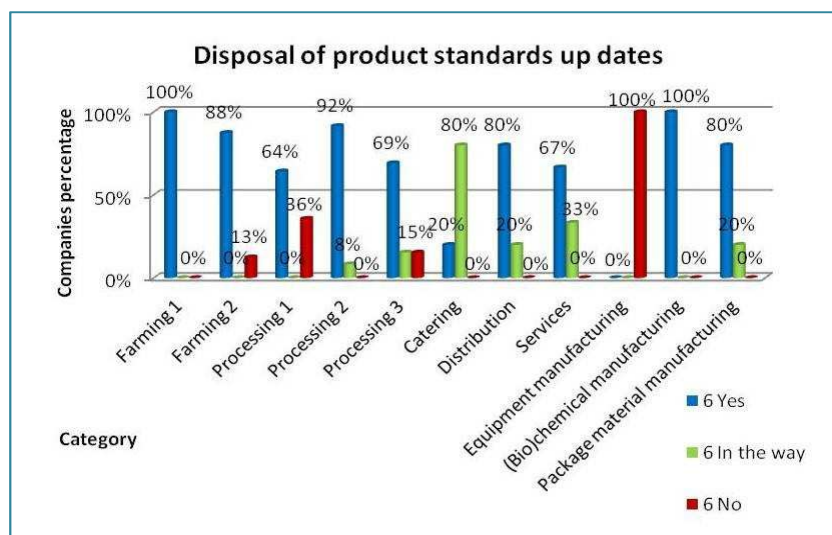
**Question No 5: Do you have all product standards related to your activity sector?**



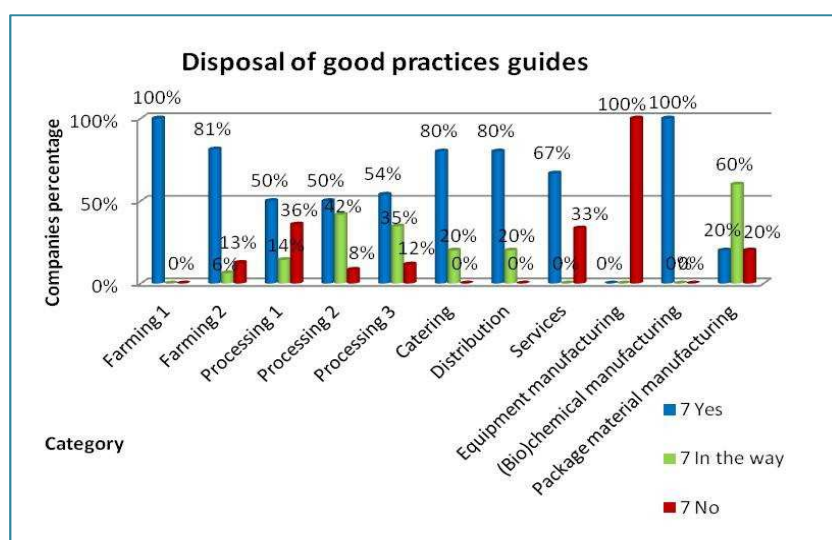
With the exception of equipment manufacturing category in which both companies don't have product standards, answers of this question show that only a few percentage of companies (15% as in the case of Processing 3 category) which don't dispose of product standards. In some categories, farming 1 and (Bio)chemical manufacturing for example, all companies confirmed that they dispose of these standards.

**Question No 6: Made you updates of these standards on a regular basis?**

Standards are up-dating from time to time, disposing of the latest version is necessary to maintain companies competitively.



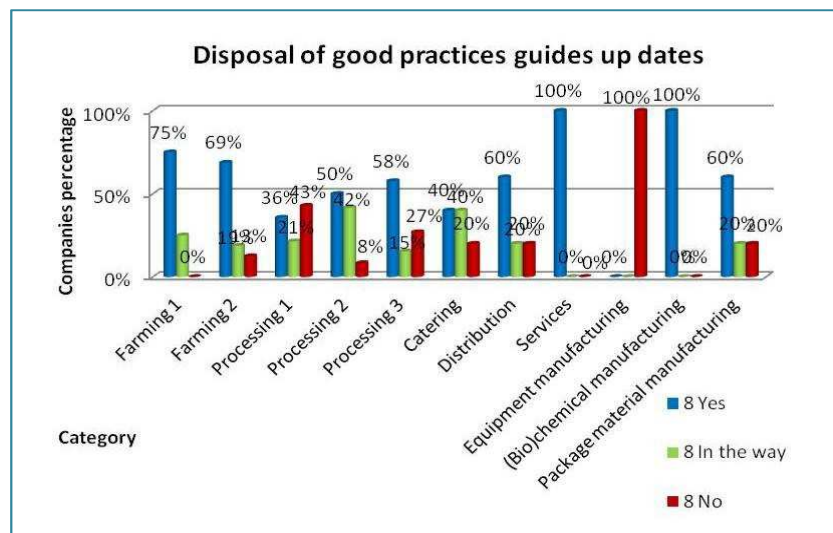
**Question No 7: Do you have all guides GMP, GHP and GLP related to your activity sector?**



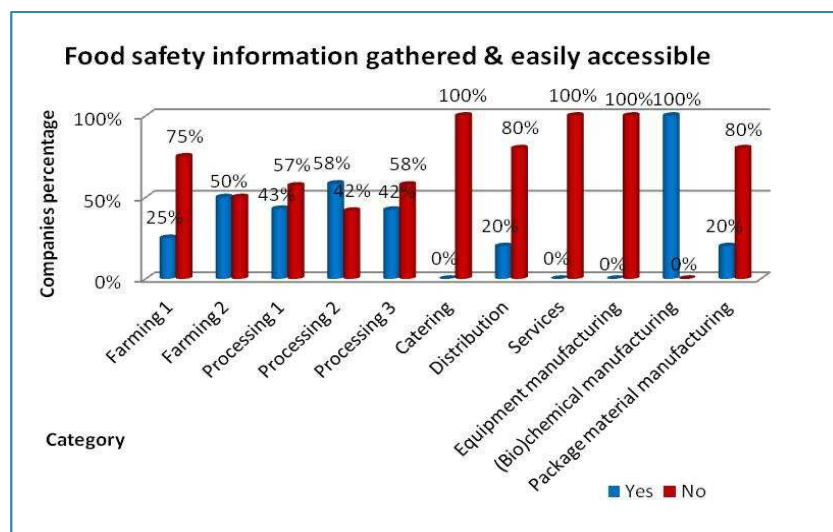
Good manufacturing practices (GMP), good hygiene practices (GHP), good laboratory practices (GLP) and production systems are used to ensure food safety [11]. In two categories (Farming 1 and (Bio)chemical manufacturing) the disposal of good practices guides claimed is 100%, 81% for Farming 2 companies and 80% for Catering & Distribution companies. In the other side, both companies of Equipment manufacturing declared that they do not dispose of this guides. For Package material manufacturing category, only 20% of enterprises stated that the dispose of them.

**Question No 8: Made you updates for these guidelines on a regular basis?**

Comparison of figures 7 and 8 shows that updating guides is much more difficult then there disposal. This is proved by the reduction of Yes percentage in almost all categories with the exception of Processing 3 which has recorded a small increase of 4%.



**Question No 9: Do you find that information about food safety (standards, regulations, PRPs, guides, etc.) is gathered and easily accessible?**

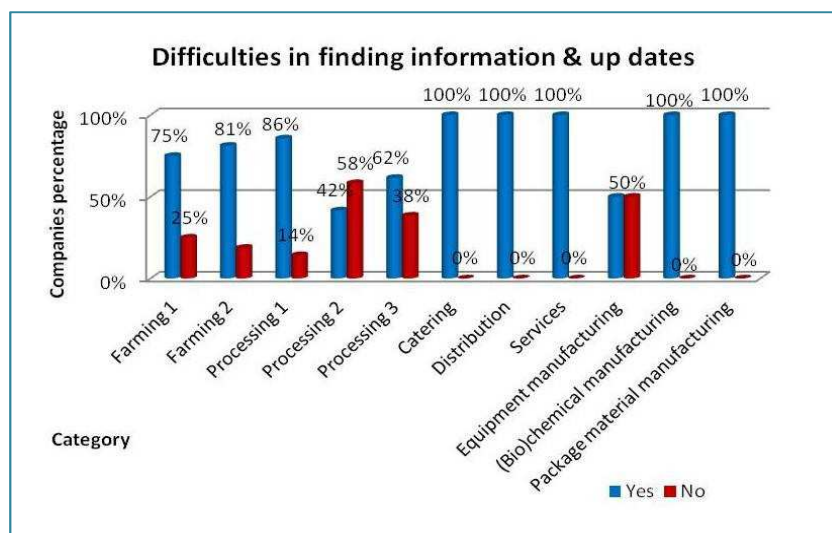


Results of this question show clearly that companies in all categories (with the exception of Processing 2 and (Bio)chemical manufacturing) suffers to collect information (standards, regulations, guides, etc.). This difficulty comes from the fact that information with relation with food safety is not gathered which make the task of quality managers harder because, in general, they are charged also of collecting and applying there content in the factory where they work.

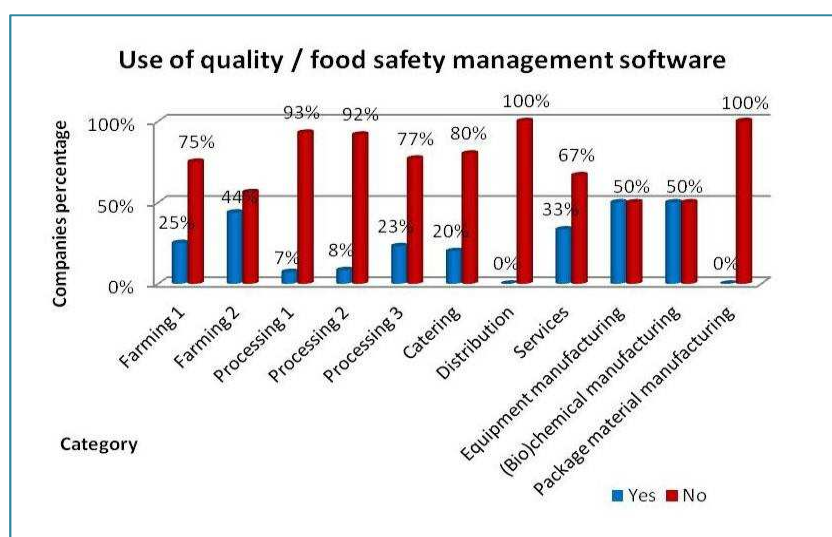
**Question No 10: Do you find any difficulties in finding this information and its updates?**

These answers confirm those of question No 9. People requested find many difficulties while collecting and updating information in relation with food safety.





**Question N° 11 Do you use software(s) for quality and / or food safety management?**



A few number of companies are using software for managing quality and food safety. None of companies belonging to Distribution and Package materiel manufacturing use such a software. Many raisons are given by these companies as explained in [6].

## CONCLUSION

Results presented in this work allow us to conclude that despite the absence of companies from categories "F: Feed production" and "J: Transport and Storage" all other food chain categories are represented. The number of companies varies from a category to another. With the exception of Distribution category, all others are exporting their product, and in each category there is certain percentage of certified and in the way of certification companies. Even answers about disposal of regulation, product standards and guides (Good Manufacturing Practices, Good Hygiene Practices and Good Laboratory Practices) and there up-dates were affirmative questions 9 and 10 responses proved the contrary. Finding this information is a hard job for Moroccan food companies because it is not gathered and easily accessible. Finally, we have found that the use of software for managing quality and food safety is very limited and doesn't exist at all in some categories.

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