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# **The Malaysian Food Barometer Open Database: An invitation to study the modernization of Malaysian food patterns and its economic and health consequences**

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Conducted within the framework of the chair of "Food Studies: Food, Cultures and Health" created jointly by Taylor's University (Malaysia) and the University of Toulouse Jean Jaurès (France), the Malaysian Food Barometer (MFB) is a recurrent survey focusing on the transformations of food patterns of the Malaysian population. MFB works with national representative samples from a socio-anthropological theoretical standpoint. Since the 1990s, research on nutrition has intensified in the country and led to the Malaysian Adult Nutrition Survey of 2003 (Ministry of Health Malaysia, 2008, which was repeated in 2016-2017). These studies focus on individual food consumption, assessed in terms of nutritional composition of the diet, including some basic socio-demographical characteristics. MFB is a complementary survey to nutritional one that explores in depth the sociological and ethnological dimensions of Malaysian food habits. To do it MFB collects face-to-face data on food-related practices, but also social norms, attitudes, cultural representations, and routines as well as their supposed socio-cultural and demographic determinants. The focus includes the repartition of food practices between home and away from home, the sources of food, the socialization of the meals and food intakes, the food temporality, the perception of risks in food, etc. A series of indexes assign individuals within the phenomena of transition (demographic, nutrition, food and protein) and of "compacted modernization" experienced by certain some Asian countries (Poulain et al., 2014, 2015, 2020, Fournier et al. 2016). The theoretical objective of the project consists of studying the social, ethnic and cultural diversification of food patterns and its changes in the context of modernization. The applied objective of the research is to allow to analyze: first the impact of these transformations on the technical and economic organization of the food industry and service sector and second the consequences of changes in consumption in terms of public health, especially on noncommunicable diseases.

The study of Malaysian eating patterns is a scientific challenge due to the multicultural character of this society and the fact that it is facing a very rapid modernization. This phenomenon that we can call after Chang (2019) we call "compacted" modernization (CM) is impacting the ways to eat of the population (Poulain et al., 2019). CM is characterized by some sociodemographic transformations, linked to the demographic transition like increase of

urbanization, decrease of fertility and reduction of the size of the household and by some socio-economic changes like increase in purchasing power and emergence of a middle class (Embong, 2007). The epidemiological transition can be read in the moving of the causes of mortality from epidemic diseases to cardio-vascular diseases, cancers, and degenerative diseases. All these structural transformations have affected the lifestyles and the food habits of the various ethnic groups which makes the Malaysian population. As many countries, Malaysia is facing obesity epidemic that raise concerns about the negative effects of such mutations and stimulate researchers to focus on the food cultures and lifestyles transformation leading to the development of this issue. If most of the above characteristics can be found in modern countries, Malaysian social context has two distinct characteristics in addition of "compacted modernization". The first one is multi-ethnicity character of the society. Officially it consists of three main ethnic groups, i.e. Malay, Chinese, and Indian (besides a few minorities). Each group has its own food culture with its typical dishes, dietary taboos and restrictions, eating rituals, structure of meals, and symbolic dimensions of food. However, 'ethnic' categories are not homogeneous. For example, Indians may belong to different religions: Hindus, Muslims, Sikhs, Buddhists, Christians, or members of New Religious Movements. They may also speak in Bahasa Malaysia as the national language of Malaysia, English, and different mother tongues (e.g. Tamil, Hindi, Urdu, and Malayalam). They may also be identified strongly by a Caste, by region of origin... and by their families which may live in Malaysia for several generations or just arrived. 'Chinese' may be Buddhist, Taoist, Christian, and Muslim converts. They may speak Hakka, Hokkien, Cantonese, Teochew, and Mandarin. They may also be Min people, Hakka, Cantonese, and Wu. Furthermore, there are Malaysians in the official 'Others' categories such as the non-Malay Bumiputra, Dusun, Iban, and Kadazan. We have to add foreigners living in Malaysia to this heterogeneous group, including expats (Executives and domestic aids), tourists, and international retirees on the 'second home' program (Tan & Ho, 2014). But boundaries between these three main groups are not totally hermetic. There is even a certain 'porosity' resulting from interpersonal relationships across ethnic boundaries, and through friendship, overlapping religious affiliation and language competence. This 'porosity' is also resulted from the usage behind the primary 'race' identity, religious conversion, and 'crossbreeding (multi-ethnic people) from historical institutionalized mixed marriages (e.g. in the Baba-Nyonya community in historic times). The second characteristic is the high frequency of food consumed outside home which is one among the highest rates in world. By growth of urbanization, the opportunities for Malaysians to eat out have increased tremendously. and prices are sometimes lower than the homemade meals. In such a context MFB is a tool to identify and study the socio-cultural determinants of Malaysian food habits. MFB focuses simultaneously on the practices and on the representations of food cultures. The aim of MFB is to help to understand the food life styles, and the different food contexts of the various Malaysian ethnic groups and 'middle class' in order to elucidate their process of making food decisions.

The theoretical perspective adopted postulates that dietary decisions are largely framed by behavioral structures pre-defined by societies and cultures. Let us take the example of an individual who "decides" to go for breakfast. Depending on the food culture to which he belongs, his reasoning and the choices he must make will differ widely. In some contexts, he will not even decide in the sense of a 'reflective act'. He wakes up and it is simply time for lunch. Let's take the cases of a French man and a British man. The room of decision of the first is going to be within structures like "hot drink" + "bread or pastry" + "butter, jam". The choice will therefore be made within the structure on the hot drink (coffee, tea, chocolate...), bread, toast, pastries, biscuits... butter, jam (strawberry, apricot, chocolate paste...). Other breakfast models are possible in this culture but not dominant. These variants can include

more foods such as cheese, cold cuts, cereals, fruit juices... They are the result of several phenomena. The first is the nutritional discourse in favor of a "hearty" breakfast, to which the food industry offer follows suit, when it does not precede it. But these variations should also be read as the aggregation of the French breakfast with the "snack". This is a "small meal" taken by workers who start their day very early in the morning. It complements a rather light breakfast. This combination of two morning intakes undoubtedly explains the large proportion of very simplified breakfasts (+ -20%) observed in the French population (Poulain, 2012). The choices of the British man will be made within the framework of a more complex structure which includes eggs, beans, sausages, mushrooms, tomatoes, toast, etc ... These "breakfast structures" are visible on the breakfast menus of international hotels, under the names "continental breakfast", "Anglo Saxon" .... In Malaysia, where different food cultures coexist, we therefore find Indian, Malay, and Chinese breakfasts with different structures and different products. Result of the colonization the British structure is also active. And in addition, some flagship products slip into food spaces and some interbreeding takes place. The "nasi lemak", for example, that is traditional Malaysian breakfast is consumed by all Malaysians ethnic groups, however with different frequencies. What have been presented for breakfast applies to all other meals. Food patterns are not only "used" by eaters. They are used by the household members, who shop, cook, and prepare meals. But also, all those who directly or indirectly participate in the production, processing and distribution of food products and services. They constitute the cognitive infrastructure which allows these actors to coordinate and contribute to the functioning of the food system. There is indeed a space for decisions, but they are embedded in the multiple structures and categories of food systems. Food Patterns are the infrastructure on which decisions are made. They function in the flow of oneself, and we are therefore only weakly aware of their existence (Warde, 2015; Poulain, 2020). This theoretical framework thus stands at a distance from the classic nutritional approach, explicitly included in the theories of rational choice. Decisions of the eaters are therefore nested in culturally defined action scenarios. There are some decisions, but they take place in a socially determined room of freedom.

The MFB is a recurrent survey that studies the socio-economic, demographic, and cultural determinants of food consumption. It focuses at the transformations of food practices and representations. It studies the mutations of food habits and tries to identify their possible influences on health, especially on non-transmissible diseases in which food is involved. It complements traditional nutritional surveys and aim to participate in the development of prevention programs (Poulain et al., 2015). MFB is based on a mixed methodology developed at the national level. The qualitative approach precedes and prepares the quantitative survey. The method is based on the distinction between social norms and practices. This technic has been developed over the last three decades in France and used in several national surveys, including the Barometer "Santé Nutrition" of the National Institute for Prevention and Health Education (INPES).

The MFB studies social, ethnic and cultural diversification of food habits in Malaysia. It studies the evolution of food consumption both at home and outside the home and identifies the consequences in terms of market factors and public health. It is based on a national representative sample (n = 2000 for MFB1 and 1600 for MFB2), of Malaysians from 18 years old to the very elderly according to the National Census. The data collection is conducted on 'normal' periods of the year (out of the religious or national feasts). The questionnaire has 6 main parts: socio demographics and ethnicity indicators, food norms, food intake in the last 24 hours (recall), cooking practices, social representations of food, health, and risk issues. The questionnaire comprises 60 items and more than 1200 variables. The method of sampling is

the quota methods based on four quotas: age, ethnicity, level of urbanisation and region of residence. It is comprised of 58 closed and multiple-choice questions, consisting of standard questions used in sociology to describe the socio-demographics of a population (Desrosieres, 1998), as well as questions that have been used in prior studies (Poulain, 2002; Rozin et al., 2006; Poulain et al. 2014).

The data collection methodology is based on a "recall of the last 24 hours" approach. This method asks the interviewee to list all food and drink intake of the day before, both during and between meals. It is quite a common method used to investigate individual food intake. Until now, it has been mainly used in nutrition sciences surveys, but we have adapted the methodology to take into account the sociocultural dimensions we wish to investigate. In the early 1980s, sociologists and economists developed intense research activity focusing on food consumption surveys. The results of this work generated some theoretical debates which gave rise to methodological advances which are subsequently benefitting the current investigation. These include awareness of the need to consider the status of the variables and the data collection techniques. Quantitative research on eating practices faces an obstacle related to the use of declarative methods to uncover, or at least get data as close as possible to the actual behavior of individuals. For example, when we ask individuals to describe the meals they ate the day before and if they have not eaten "as usual", or if they ate differently from their normal pattern, "what they think they should have done", they feel uncomfortable. Indeed, what should they answer? What they actually did, or that they usually do? The problem methodologically, is that all individuals do not solve this dilemma in the same way. Some of them, respecting the instructions of the interviewer, faithfully describe the food intake of the day before, while others, eager to report their usual way of eating, are tempted to change their statement from the actual to the usual, to reduce the cognitive dissonance they feel. All seek to translate what they think is the reality of their food practices. In the second case, the data collected can be said to be more related to their perception of "social norms" which are a mix of social and nutritional requirements -than to their actual practices. Thus the data obtained have a fairly weak empirical value because it represents neither a complete picture of the real behavior of individuals, nor of the social representations (norms and values) relating to food in the social group being studied. In an attempt to resolve this ambiguity, some studies, have accommodated the development of a collection method which facilitates the distinction between practices and norms, using a questionnaire administered during a face to face interview (Poulain, 1996; Poulain, Guignard, Michaud & Escalon, 2010). This is done by first inviting people to say what they consider to be a "proper meal", a "proper breakfast", a "proper lunch", etc. And this is presented to them as taking place in an ideal setting, when nothing has disturbed the material organization of the preparation and consumption of these meals. This method is an extension of the work of Mary Douglas (1971) on "deciphering a meal". Through this process, the social norms are collected for the meals under consideration. In the second step, when the interviewee is "liberated" from the normative pressures by his or her statement, another series of questions is proposed to help the individual to rebuild his or her food day. The interviewer begins by specifying that what now interests the research team is what really happened, what has really been eaten. S/he explain that, working at the level of the total population, it is not a problem if the meals eaten by the interviewee differ from what has been said in the first part of the questionnaire, when the informant tells what s/he thinks should be done, or what s/he usually does. The first type of data corresponds to social norms, that is to say, provides an aggregate of guidelines that are rooted in cultural, social and family traditions. They result from the specific socialization of an individual. But these norms are also impacted by the prevailing discourses of public health in relation to diet, or by the pressure of prevailing models of desirable body shape. The second type of data always retains

the status of declarative data, but is much closer to the actual practices of individuals. With such a method, the data collected gained precision, and it is possible to distinguish norms and practices and their relationships with each other, particularly for the exploration of various forms of change. The improvement of data collection methods is an important issue in this research. The ability to distinguish between norms and practices allows a deeper understanding of the transformation of eating habits. The distinction between norms and practices is a solution devised to improve the empirical quality of the data, but it has a cost because it greatly increases the length of the questionnaire and almost always requires face-to-face data collection.

Figure 1: 24 hours recall, food intake recording method.

To reconstruct the interviewee's 24-hour food intake, the style of data collection will be pitched in the middle ground between a qualitative and a quantitative approach. The questions are intended to be a sort of guide to help the interviewee to remember the food intake composition and structure, the time of consumption, the terms/conditions? of the acquisition and the socio-technical contexts of consumption, including the ethnicity of the persons with whom the food intake was shared. The form and sequence of questions have been developed to reflect the Malaysian context, including the high frequency of consuming food away from home, or as takeaway food, and the variety in places of consumption. The database includes two MBF waves of data collection (2012-13, N= 2000 and 2018-2019, N= 1600). If some results have been produced and published (Poulain et al, 2014; Poulain et al, 2019; Poulain et al, 2020; Fournier et al, 2016; Tibère et al. 2018; Drewnowski et al. 2020), the MFB data base allows a deep description of food patterns and an analysis of their social determinants like:

- Describe the food habits, practices, social norms, social representations, and beliefs, pertaining to food,
- Measure frequency of eating out,
- Identify food lifestyles with a focus on ethnicity,
- Analyze the correlation between lifestyles and above-mentioned characteristics,
- Explore the correlation between lifestyles and BMI,
- Analyze risk perceptions linked to food.

These points can be correlated with socio-demographic and ethnic variables such as social status, gender, age, social dynamic, ethnicity, religion etc., It is possible to carry out comparative analysis between different time periods in Malaysia and with other countries. Some indexes are available. • The "Modernization index" is a weighted combination of level of urbanization, Size of household, level of income, Evolution of income, level of Education. 
$$\text{Modernization Index} = (\text{Urb} \times 3) + (\text{Size Household} \times 2) + (\text{Income} \times 3) + (\text{Evolution Income} \times 1) + (\text{Education} \times 2).$$

Food days that can be studied in terms of composition, number of food intake (meals and small meals and snacks), temporal implantations... -Meals that can be studied in terms of composition (food and drinks), of structure (diachronic, synchronic, mixt), of place (in the house or out), of socialization, of ritualization, of time of the day, morning, moon, evening... (it could be breakfast, lunch dinner or supper)-Small meals and snacks that can be studied in terms of composition (food and drinks), of place (in the house or out), of socialization, of ritualization, of time of the day.-Snacks and all food intakes can be analyzed in terms of social norms using the following dimension. The comparison between the meal standards and the practices implemented reveals a process of individualization. Lunches, for example, are practices with in particular individual portions, while lunch social norms are based on shared dishes. Practices change faster than the norms. However, meals are very largely socialized. The localization of food at home and out of the home is done with 2 complementary methods

the 24 hours recall and a reconstruction of the week before. The eating out can be studied by individual population and by meals (all meals together). These data can be crossed with different descriptive variables.

The MFB database is made available in an "open science" philosophy. Let us me remember the spirit of Open Science. It is a movement which consists in opening the research process to all types of actors concerned by the topic (scientific partners, economical actors, public institutions, citizens, NGOs...). It uses the opportunity represented by the "digital mutation" to make research data easily accessible and reusable (CNRS, 2019). In our case, the MFB1 report has already been freely accessible since 2015 and the MFB2 will be available shortly. The provision of the database itself is a new step. Sharing research results and data, not only between scientists, but also with all stakeholders in society, is a way of disseminating, a way of developing partnership relations with all the different actors concerned by the subject of the research. But it is also a way of advancing knowledge, a way to co-construct the knowledge. And finally, the objective of open science is to accelerate the process of scientific production itself (Nielsen, 2012; Mirowski 2018).