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Research Article

Ranking of rural localities in Malta and Gozo according to their degree of exposure to traditional locally produced fare

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Abstract. Mediterranean fare originated from regional ethnic groups living in the region, and, other than from external cultural influences, the ingredients used mostly originated from local production. In evaluating the role of tradition in Maltese food culture, three factors, namely part-time farmers, kitchen gardens, and small livestock numbers, appear to have characterised food production within a Mediterranean island agricultural landscape that was dominated by small holdings. This study evaluates Malta's different rural localities, ranked according to evidenced agricultural activities in small farming holdings, which, by their self-sustenance, appear to have retained traditional Maltese rural features. This paper is a first attempt to provide a guideline for selecting locations to evaluate production and consumption patterns of traditional Maltese food in rural areas. The research is not intended as a farm structural or policy analysis as it ultimately focuses on production factors linked to rural fare.

Keywords: Malta, locations, rural food, surveys, food.

1 Introduction

The 'Mediterranean diet' was first studied by Keys and F. (1957) as the typical food consumption pattern prevalent in olive-growing areas of Crete, Greece and Southern Italy in the late 1950s and early 1960s (Trichopoulou & Lagiou, 1997). With slight modifications, the same is found in regions of Italy, Albany, Spain, France, Lebanon, Morocco, Portugal, Syria, Tunisia and Turkey (Willett et al., 1995). The Maltese food consumption culture has been historically attributed to several aspects of the Mediterranean 'model' that originated from the various ethnic groups living in regions along the shores of the Mediterranean Basin and this permeated in different ways. Apart from normal relations between the different cultures, the region also has a long history of conquests whereby other than seizing power, dominating forces also imposed their cultural practices and associated food preferences. Through time boats, carriages, merchandise and civilisations, as well as creative ideas and religion converged. Trade and migration within the region led to the inevitable exchanges in cultural influences and gradually modified the components of different recipes. Mediterranean gastronomy is not just based on the crops and livestock that were grown, but it also incorporates aspects of the way of cooking, family and social dimensions, encompassing landscapes, and accumulated culture, art, and traditions—including religion.

Perhaps an appropriate starting point as to what the rural Maltese food consumption patterns were in the early 19th Century, is found in The Royal Military Chronicle: Or, the British Officer's Monthly Register, Chronicle, and Military Mentor ("The Royal military chronicle", 1811). This document describes that the staple Maltese diet consisted of oil on bread, with some salted anchovies, herrings, or dried fish, especially on those days when religion did not allow the consumption of meat, which is not just limited to the whole period of Lent, but also included every Wednesday, Friday, and Saturday. At the time, the Maltese consumed many artichokes, celery, onions, hog beans, lupins, chickpeas, pickled olives, green figs, prickly pears, raw or with bread, or chestnuts, apart from consuming other various grown vegetables. This, together with some wine and bread formed the basis of nutritional consumption (Buttigieg & Cassar, 2019; Cassar, 2013) frequently comprised the whole nourishment for the day. In Cassar (2016), Maltese food habits, the author remarks that while "Bread has always taken first place in the Maltese kitchen" the type of bread consumed by an individual reflected his status within society. Hence the upper classes customary consumed the refined white bread type kneaded with wheat flour, whereas the bread consumed by

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the lower social strata was a rather coarse, brown based meslin bread kneaded from a mix consisting of wheat and barley flour mix.

Vegetables were in abundance and grown throughout the year. These included: aubergine, tomatoes, turnips, carrots, potatoes, cauliflower, broccoli, artichokes, green peas, French beans, several salads, celery, and long marrows. Some of these vegetables were used in soups, sauces, boiled, or with meat nearly the whole year round. In the early 1800s potatoes were still a recent introduction and were not a popular ingredient. Fruits such as figs, citrus, watermelons, pears, nectarines, apricots, peaches, grapes, pomegranates, strawberries, plums, dry figs, dates, and almonds, were also consumed in great quantity. Bread was made from whole wheat flour, sprinkled the sesame seed on the crust. Sesame seed was frequently used in dishes and soups. The Maltese used olive oil, which was imported from Sicily and North Africa. Salted butter was imported from Ireland primarily to satisfy the palate of the English inhabitants. Sheep's milk was transformed into traditional cheeslets (ġbejniet) whilst other cheese was imported from Sicily. Fresh milk was supplied chiefly by goats, which were milked just outside houses, to ensure freshness.

Pork was of high quality and readily available, though mutton and veal were rather scarce. Kids and rabbits afforded frequent nourishment and were not only sold in the market, but, every family in towns and villages reared them for their consumption. The role of rabbit meat in Maltese culture and as a food item for consumption is well documented (Buttigieg & Cassar, 2020; Cassar, 1994, 2016). Turkeys, ducks, hens, capons, chickens, guinea hens, and plump types of pigeon squab were all available and were complimented with seasonal migratory birds of passage—mostly quail, snipe, and ducks. Although these food items were directly available to the rural inhabitants, emphasizing the population and territory's intimate link due to their proximity to rural areas, the urban population could also attain of in-season vegetables and fruits sold in different village shops or bought from hawkers in the streets. The largest market was that found in Valletta and was well stocked with provisions of all kinds of animal products, vegetables, fruits, and fish which, for the convenience of the buyers, were sold at the same place. A large fish market was also located by the quayside in Valletta, and here fish was to be found in abundance.

More recently, Maltese gastronomy was described by Caruana (1998) as being made up of a blend of different traditions improvised over time using locally available ingredients, and that gave a specific identity to Malta and the Maltese, a definition that matched the description given in 1811. The diet contained a direct contribution of seasonal (Caruana, 1998; L. Sammut, 1977) cultivated fruit and vegetables, and non-cultivated ingredients such as fennel and carob amongst others. Crops were generally complimented with limited diversity and supply of animal products from raised livestock that included milk, cheeslets, eggs, and meat from spent hens, capons, rabbits, squab, and pork. Most of these animals complemented the frugal way of life of our ancestors in their small holdings. The limited resources obliged the minimizing of waste, and livestock was used to varying extents as scavengers and recycling vehicles of kitchen scraps and other edible garbage thus eliminating any waste of food. In this way, the diet and cuisine in rural Maltese localities have been inherited from their ancestors who primarily attained their food through backyard farming with a relative degree of self-sufficiency—barring crop failure. Beef did not form part of the diet in rural Malta and was but a recent addition following the arrival of the British forces.

The Roman Catholic faith also played a huge contribution in shaping the Maltese culture and heritage. Devotion led to various dwellings for worship, but it also had an impact on civilian lifestyle and habits including many culinary traditions. While many traditional Maltese sweets are baked during certain religious holidays or festivals, such as Lent, Easter, or Christmas, there was also the custom of restricted consumption of meat Wednesdays and Fridays , which was more observed in the past (S. Zammit, 2011), and the consumption of particular food on certain days, such as qubbajt (nougat) normally associated with the village festas, qagħaq tal-Appostli a bread ring eaten on Maundy Thursday and Good Friday, figolli for Easter and the consumption of vegetables such as globe artichokes during Good Friday (Wirth, 1991). Thus, religion would likely influence the consumption habits of the elderly who were found to have a high attendance rate to Sunday mass (Inguanez & Ellul, 2018).

As with any other custom and tradition, food preparation has also been passed on from one generation to another. Both Tessier and Gerber (2005) and Piscopo (2004) emphasized the important role of mothers and grandmothers in transferring recipes and in promoting and exposing their children and grandchildren to rural fare. Hence, the findings of Inguanez and Ellul (2018) tend to complement those of Tessier and Gerber (2005) and Piscopo (2004). Data on the dietary habits of the Maltese population are limited (Pace et al., 2004). Mizzi (1994) reviewed the food consumption patterns in Malta for the 1960–1990 period. His observations trends tally with those expressed by Helsing (1991) citing Vuksan et al. (1982), who highlights that "the Maltese diet has for historical reasons many traits in common with that of Northern Europe". Mizzi (1994) indicates that the one

hundred and fifty years of British colonial rule, the impact of tourism—both inbound and outbound—and the media, as possible factors contributing to this food consumption model. Malta joined the DAFNE V project in 2003. This project provided an opportunity to use the Household Budget Surveys (HBS) for providing information on the dietary habits of the Maltese population. Pace et al. (2004) and M. Sammut (2006) presented their HBS observations and results indicated a general increase in the daily availability of most food groups, that could have reflected:

1. an increase in the variation of food stuffs available,
2. an increase in the national production of most commodities,
3. the 'all year round' availability of previously seasonal food items and
4. the action plans of the Health Promotion Department to promote the value of the Mediterranean diet together with the 'five-a-day' campaign to consume at least five portions of fruits and vegetables daily, implemented at the end of the nineties.

The results suggested that the highest availability of most food groups was associated with retired people as head of households. The fact that retired people may have more time available to dedicate to preparing homemade meals than workers is reflected as a higher quantity of foods purchased to supply for their children's families, especially since more women chose to re-enter the workforce. However, decreases in the purchasing capacity reflected a decrease trend in food availability for most food groups between 1994 and 2000. The results relate solely to purchased food and do not include any household availability of family produced food products that are the basis for the preparation of typical foods and the conservation of consumption culture with a Maltese identity. Although contributions from own production are systematically recorded in the national HBS, the Maltese Statistical Office did not collect this information as own production was considered as negligible.

In 2015, the European Commission stated that because of globalisation and urbanisation, the food consumption habits of the Maltese had evolved partly due to the increasing availability of greater variety of food with dietary patterns that no longer corresponded to the traditional Mediterranean diet. However, the same report stated that in Malta "food is seen as a cultural signifier that embodies tradition and identity: eating traditional dishes at certain time of the year is considered as a food ritual and fosters a sense of cultural belonging".

Recently, two studies (Cuschieri and Libra (2021) and Treki and Jones (2021)) were published on the adherence of specific groups within the Maltese social strata to the Mediterranean diet. In evaluating the food habits of the adult dietary habits, Cuschieri and Libra (2021) remark that while the Maltese food culture have never been portrayed as matching the Mediterranean diet due to the British influences, their results indicate a progressing scenario in which the Maltese adult population, similarly to what is being recorded in other Mediterranean islands, is shifting away from the cultural diet and promoting a more Westernized diet. Similar trends were observed by Treki and Jones (2021) when studying the dietary patters of students at the University of Malta. This scenario has prompted the emergence of a movement to revalorise and facilitate the typical Mediterranean diet.

Observations of agriculture in the Maltese Islands suggest that farming systems changed at varying rates over time in response not only to natural conditions that determined what crops would grow or not, but also to a wide range of production factors related to availability and cost of land, labour, input materials and the prevailing market situation (Food and Agriculture Organisation of the United Nations, 1988)[p. 32–34]. During May 1991–January 1992, an FAO/TCP mission assisted the Government of Malta in the preparation of an in-depth policy analysis and review of the agricultural sector aimed at the implications of new international and domestic policy changes necessary for eventual membership to the European Union. At this point, the mission confirmed that while the economic role of agricultural sector had decreased to less than 3% of the Gross Domestic Product, and that farming in the Maltese islands had become a part-time business as less than 10% of farmers were full-timers. The 10,700 hectares of agricultural land gave an average farm size of 0.7 ha for the 15,000 farmers and, furthermore, about 45% of the farms were between 0.01 and 0.5 ha (Food and Agriculture Organisation of the United Nations, 1992)[p. 4].

The 2020 NSO Census of Agriculture, indicates that, as from 2010 to 2020, the number of agricultural holdings decreased by 14.8% from 12,268 in 2010 to 10,449 in 2020. Of these, there were 4,327 agricultural holdings or 41.4% whose produce was solely for their own consumption, while the remaining 6,122 holdings or 58.6% sold all or part of their produce. The amount of utilised agricultural area decreased by 6.2%, from 11,445 hectares in 2010 to 10,730 hectares in 2020. Furthermore, the agricultural labour force declined by 25.8% per cent, from 18,212 persons in 2010 to 13,511persons in 2020 (National Statistics Office, 2022). The prevailing situation, is that, with an ever-increasing population on an island with few natural resources, the agricultural base has suffered continuous infringements to meet other priorities.

Malta's accession to the European Union in 2004 further contributed to the transformation of food consumption patterns. Mizzi (1994) highlights that sociocultural features, demographic patterns, and consumers' attitudes and perceptions of different foods play an important role in moulding consumption patterns. Since accession to the European Union, Maltese demography experienced an influx of non-Maltese settling in Malta. The dynamics of these newcomers are not homogenous and can broadly speaking be classified as:

1. EU citizens entitled to free movement,
2. Non-EU citizens that reside based on a worker's visa,
3. Irregular immigrants.

These new settlers have brought along their particular cultural identity, the bulk of which form part of the national labour force originate from Eastern Europe, Near East, Middle East and central African countries. The residential clusters where these newcomers settle are experiencing a gradual shift from what was perceived as a typical Maltese lifestyle, including food consumption habits that were tweaked to accommodate and adopt the imported customs and tastes. This implies a new identity of changing communities that is bound to influence Maltese gastronomic development.

The island's food consumption patterns have always been in a continuous state of flux. The ongoing cultural and social changes are leading to busy lifestyles with a greater prevalence of foreign products and influences. This is also affecting the traditional Maltese cuisine, possibly inducing the loss of some of its important aspects, if not completely replacing it in some instances. The potato story is a case in point. While the farmers and people were conservative and somewhat sceptical of the newly introduced potatoes, it now ranks at par with bread and pasta, so much so that Buttigieg (2014) felt it pertinent to ask: 'And which is the 'authentic' fenkata, the one served with potatoes?'. This suggests possible issues which students and academics in the fields of agricultural sciences, marketing, food science, and nutrition will face when selecting locations and parameters on which to base their research when they are seeking to evaluate consumption patterns of traditional Maltese food. It, therefore, appears pertinent to compile all available data and provide guidelines on location selection about research on cultural food consumption. The aim of this study is to identify and rank the locations that have a greater probability of having inhabitants that still retain a local production and food consumption culture synonymous with the identity of the Maltese rural society.

2 Methodology

Initially, the following data was considered to contain the key indicators directly connected with localities that maintain a style of food preparation and consumption linked to traditional rural food culture: agricultural area, population density, number of foreign inhabitants, kitchen gardens, and backyard farming as characterised by the number of small flocks of sheep, goats, and poultry, full-time farmers, part-time farmers, and total farmer population—whereby the NSO distinguishes farmers by as to who works more, or less, than 1800 hours. It was assumed that kitchen gardens and the backyard livestock holdings were not managed on a commercial basis but served to provide a supply of staple food to the family and extended members of the family and possibly neighbours. Data on these indicators was obtained from the National Statistics Office (NSO). In the case of livestock numbers, this refers to the number of heads on small holdings that have less than 10 sheep and goats, plus chickens and laying hens that are exempt from a commercial licence.

The indicators were analysed to identify which parameters are closely correlated. The CORREL function in Excel was used to find the correlation coefficient between the various parameters. The correlation coefficient (a value between -1 and +1) gives an indication of how strongly two variables are related to each other. Based on values of the correlation coefficients a group of the most relevant parameters were selected. A final ranking of the rural localities most likely having a high percentage of its population that still retained the rural food preparation and consumption habits were consequently calculated for each location as follows:

$$\frac{\left(\frac{\sum \text{of parameters having strong correlation greater than 0.8}}{\text{total population of the location}}\right)}{\text{highest value}} \times 100 \tag{1}$$

This ranking was based on the degree of exposure per inhabitant of that particular locality to the selected indicators.

3 Results and Discussion

3.1 The Maltese urban-rural dichotomy

The Maltese urban-rural dichotomy was studied to some extent by A. Zammit (1986, 1990). The main factors that generally shape settlement patters are issues of economic, social, cultural, environmental, and other factors. In the not-so-distant past, when the strategic importance of the Maltese islands was still had to affirm itself, their whole economy depended on agriculture. The quality and

quantity of Maltese agriculture has always been dictated by enlarge by the geophysical characters of the territory. Often described a semi-arid territory with shallow soils, land production was governed by the availability of irrigation water. Land that had access to water, through natural springs or otherwise, was generally used for the production of vegetables and food crops, whilst the other areas that were dedicated to cash crops such as cotton and cumin in the past now have potatoes and tomatoes, in areas supported with drip irrigation. Remaining e areas have been utilised for fodder production. Up to the 1950's the main livestock were the sheep and goats. While goat's milk was predominantly dedicated towards fresh consumption as liquid milk, sheep's milk was transformed into a soft curd cheese known locally as ġbejniet. Other courtyard animals included rabbits, poultry and pigeons. With the coming of the British era, a new agro-industrial sector evolved based on the importation of live bulls to be fed on imported feed to be finished off to supply the British forces as well as the resident population with beef. This economic activity provided opportunities of prosperity and contributed towards making available larger quantities of manure to apply to soil. The goat population that suffered a significant shrinkage to provides meat during the second world war., The scheme introduced in 1956 to substitute goats for dairy cows to curtail the spread *pf brucellosis*, also known as Malta Fever, further decimated the goat population (Rizzo Naudi, 2005).

Meli (1994) noted that observations of agriculture in the Maltese Islands suggested that farming systems changed at varying rates over time in response not only to natural conditions that determined what crops would grow or not, but also to a wide range of production factors related to availability and cost of land, labour, input materials and the prevailing market situation. While other natural factors, geology, topography, climate and soil types provided the basis for land utilisation, the cumulative results of long continued action plus the interaction of historical, political, economic and technological factors, not only influenced the changing patterns of land use, but dominated over factors of production. The conceptual framework of size has dominated as well on the behavioural activity of farmers in their outlook towards crop patterns or methods of livestock production by increasing the possibility of minimization of inputs or effort. Through time, a system of hamlets, villages, towns and cities evolved with distinct urban and rural identities where one is a boundary condition of the other. Within this context, the Maltese rural spaces were the main source of food and at the same time provided for employment and income for many people. However, although Maltese farming was productive, it is a well-known fact that Malta, that even since the late Middle Ages, did not produce enough wheat to meet the island's needs and hence wheat, cereals and pulses were imported regularly from Sicily (Wettinger, 1981).

Meli (1994) observed that throughout Malta's history, the progress of society was affected by the agricultural base in that an always increasing population required food to survive. During the country's evolution, transition of agricultural land and workers also met other development needs, and planning policy, directly or indirectly, always reserved a role for the agricultural sector. Initially the practice of farming was based more on necessity than choice as this job involved incessant toil. Updated managerial and technical inputs improved the situation though ultimately land use and agricultural productivity resulted in regional differentiation.

Generally speaking, rural and urban areas are often conceptualised as two separate entities, and their main connection in term of land use are via flows of agriculture products from rural areas to urban centres (Seto et al., 2012). However, urban expansion has given rise to a dichotomy, that can be simplified if the rural and urban areas are considered as extremes of a gradient with many landscapes being a mosaic that combine rural and urban land (Kroll et al., 2012; Radford & James, 2013).

With the gradual evolution and modernisation of lifestyles characterised by complex economies, technological progress, socio-cultural aspirations, increased affluence, and leisure, the challenges and problems in the planning process escalated—often compounded by long periods of laissez-faire attitudes and wrong decisions. Ideally the hierarchy of settlement should reflect a pyramidal structure, with the urban centre at the vertex. The author noted that the physical demarcation lines of some settlements have disappeared, thereby giving rise to three clusters of conurbations namely: Valletta-Ħamrun-Sliema, Paola-Cottonera, and Birkirkara-Lija-Balzan-Attard agglomerations. In most cases, urban expansion in Malta has happened at the expense of agricultural land, yet any remaining agricultural land parcels enclosed by urban sites and any other land that has been subjected to fragmentation mostly due to inheritance practices are increasingly being used for recreational purposes and hobby farming to supply the household with fresh locally grown produce.

3.2 Rural areas and population

Before 2004, when Malta's first Rural Development Plan was being engineered, one of the issues of concern was the designation of rural areas as defined by the Organisation for Economic Co-operation and Development (OECD), which essentially stated that at Nomenclature of ter-

ritorial units for statistics (NUTS) 5 level, rural areas were those that had a population level below 150 inhabitants per square kilometre. This would have automatically excluded all of Malta as being rural. However, given that such a definition would have also created limitations on the Benelux countries, the Committee on Agricultural Structures and Rural Development (STAR Committee), through the OECD, allowed for the adoption of more nuanced rural definitions that incorporate differentiation from functional urban areas and reflect their specific needs. (A. Meli, Malta former STAR Committee representative—personal communication, June 2021) Malta's rural areas were first defined in the Rural Development Programme for Malta 2004–2006. For the purposes of agricultural and rural development planning, it was determined that a rural locality will be defined as a NUTS 5 level, with a population density lower than 5,000 persons per square kilometre. Based on this definition of rurality being adopted, 54 localities were classified as rural—40 in Malta and 14 in Gozo. These rural localities covered 96% of the islands' territory and 74% of the total population. The additional definitions that were adopted for the 2007–2013 period where more than 10% of the locality had to be agricultural land, and not less than 35% of the locality had to be outside the development zone, resulted in 5% less of the rural area and 10% less of the total population. At this point, local rural areas covered some 288 km^2 of the total islands' area with a population of 257,606, and an average population density of 896 persons per km^2. On the application of this definition of rurality, 47 localities were classified as rural, 33 in Malta, and 14 in Gozo. These 47 localities accounted for 91% of the islands' territory and 64% of the total population. Tables 1 and 2 presents the profile of the rural localities as established with these parameters and includes the key indicators selected for analysis.

3.3 Correlations between the key indicators

Indicators that showed correlation coefficients larger than $+0.5$ and lower than -0.5 were Agriculture area, Full-time farmers, Part-time farmers, Total farmer population, % Farmers, Population density, Sheep, Goats, Layers, and Kitchen gardens. Indicators that fell within the range of $+0.5$ and -0.5 were deemed to have too small a coefficient to be assumed as having an impact on rural food consumption patterns. To this effect, the multiple correlation analysis revealed that three chosen indicators, namely % non-Maltese persons, population density, and broilers follow an independent pattern and show no correlation with the rest of the indicators.

3.4 % Non-Maltese People

While prima facia review of tables 1 and 2 does not provide much in terms of conclusions, one notes that with regards to the infiltration of non-Maltese in localities classified as rural, their greatest presence is in coastal localities, i.e., 29.8% in Birżebbuġa, followed by 21.01% in Saint Paul's Bay and 11. 1% in Mellieħa, with a total number of inhabitants of 8397, 14054, and 7935 respectively. Most probably, since the bulk of non-Maltese are members of the workforce, they are presumably opting to settle in urban rather than rural localities due to easier logistics to and from the place of employment, however Birżebbuġa and Saint Paul's Bay are also renowned as being dormitories of the foreign working class, most probably due to lower rents in these localities as compared to the more central urban centres. The next cluster of localities having a non-Maltese population of 8%–11% all fall in Gozo: Għarb, Għasri, San Lawrenz, Munxar, and Żebbug (Gozo)—with a total number of inhabitants of 1150, 383, 571, 986, 1732 respectively. The infiltration of foreigners involves a wide range of drivers other than strictly economic ones (Milbourne, 2007), as some individuals may be seeking a connection with the rural environment so much so that Għarb, Għasri, San Lawrenz and Munxar are renowned for their rustic farmhouses and houses of character. This study indicates that when all these aspects are taken into consideration together with the fact that the numbers in rural areas are overall very small, shows that this parameter is not relevant to the scope of this study.

3.5 Agriculture Area

Since arable land is the main fabric that will allow for the evolution of agriculture and hence rural communities, it is of no surprise that this indicator showed strong positive correlations at over $+0.8$ with farmers' population. Farmers that till the land, sheep that feed on roughage, and kitchen gardens all require the land base to exist. While the correlation coefficient of sheep stands at 0.77, goats and poultry have a coefficient below the 0.5 cut-off point suggesting that these indicators are not dependent on agricultural land.

3.6 Population Density

Results show a strong negative correlation (-0.709) between population density and % of farmers. High population density is synonymous with the presence of concentrated habitation. High-density pockets are not typical of rural community areas although they may infringe. though with limited exposure and interaction with rural aspects.

Locality	[a] % Non-Maltese People	[b] Surface Area in Km^2	[b] Agriculture Area in ha	[b] % of Agriculture Land	[b] % ODZ	[b] Total Population	[b] Population Density	[c] Full-time farmers	[c] Part-time farmers	[d] Sheep	[d] Goat	[d] Broilers	[d] Layers	[d] Kitchen Gardens in ha
Rabat (Malta)	2.08	26	1702.1	63	95.6	10943	422	180	1168	250	81	50	556	110.9
Mosta	2.69	7	368.9	54	70.3	19273	2914	90	713	54	6	0	1324	115.8
Siġġiewi	1.41	20	926.5	46	95.3	8210	413	52	729	209	69	18	313	125.7
Żebbug (Malta)	1.29	9	410.6	47	82.7	11468	1337	68	592	139	98	50	383	76.4
Żurrieq	1.27	8	344.1	40	84.8	10286	1216	31	654	159	73	18	282	99.1
Żabbar	0.75	5	286.6	54	72.5	14709	2788	67	411	85	54	20	520	48.8
Qormi	2.19	5	174.4	34	58	15958	3259	78	266	65	94	20	618	52.1
Qala	7.19	6	80.3	14	90.5	1703	309	1	139	46	21	665	228	20.4
Xewkija	1.72	4	135.6	30	73.9	3089	694	29	306	167	81	103	372	42.6
Mellieħa	11.1	21	562.9	24	91.2	7935	382	62	554	118	36	0	100	103.1
Żejtun	0.7	5	334.9	62	63.6	11147	2112	48	548	128	88	0	100	51.3
Xagħra	4.99	7	246.3	32	98.5	3770	520	20	444	103	44	147	104	59.6
Mġarr	2.62	16	742.6	46	97.2	3450	216	160	356	118	10	0	224	44.7
Luqa	1.63	6	101.8	15	83.5	5621	879	14	260	34	11	66	359	37.6
Ta' Kerċem	3.94	5	249.4	45	93.2	1681	313	30	200	55	18	20	415	39.9
Nadur	3.1	7	283.4	40	87.5	3851	554	35	449	139	57	12	12	65.9
Qrendi	1.82	5	226.4	46	91.7	2641	544	13	270	22	11	262	143	34
Victoria	2.41	3	172.2	59	52.5	6075	2157	34	284	76	55	74	174	37.2
San Pawl il-Baħar	21.01	12	628.5	43	83.5	14054	1129	107	302	49	16	0	100	85.3
Birżebbuġa	29.81	7	328.7	35	58.8	8397	1130	9	354	81	45	25	12	54.4
Xgħajra	2.02	1	16.3	16	74.8	1601	1627	0	3	0	0	0	525	3.7
Dingli	1.06	6	366.3	64	94.7	3561	620	36	314	81	11	0	29	54
Ta' Sannat	4.56	11	259.9	27	88.8	12766	1113	30	248	107	45	0	10	80.2
Lija	4.89	3	40.6	16	51.4	11809	4643	25	99	4	3	46	252	18.5
Kirkop	0.91	1	41	37	76.3	2297.0	2001	4	160	67	21	36	142	13.6
Għaxaq	0.86	4	122.2	31	86.2	4606	1188	15	222	88	44	0	40	33
Żebbug (Gozo)	8.31	7	230.3	30	78.8	1732	244	7	184	25	10	39	127	41.5

Table 1: Profile of rural localities as of 2006 together with the key indicators.
Source: (a) NSO 2016. Demographic Review 2014 (b) Rural Development Programme for Malta 2004–2006 (c) Census of Agriculture 2001 (d) NSO unpublished data.

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Locality	[a] % Non-Maltese People	[b] Surface Area in Km^2	[b] Agriculture Area in ha	[b] % of Agriculture Land	[b] % ODZ	[b] Total Population	[b] Population Density	[c] Full-time farmers	[c] Part-time farmers	[d] Sheep	[d] Goat	[d] Broilers	[d] Layers	[d] Kitchen Gardens in ha
Mqabba	0.95	3	68.7	26	85.5	3236	1238	16	149	44	30	100	22	33.2
Għajnsielem and Comino	4.47	7	129	17	89.4	2563.0	369	15	133	43	11	2	113	24.6
Safi	2.64	2	132.5	57	86.3	2066	908	3	165	30	18	0	99	21.3
Għarb	10.38	4	127.9	27	91	1150	258	8	114	50	15	0	76	18.6
Gudja	1.38	2	165.6	72	83.6	3007	1331	3	219	36	0	0	0	13.4
Naxxar	4.56	4	319.1	68	82.2	1779	477	13	132	63	42	0	0	20.2
Għargħur	4.91	2	100.5	50	86.2	2557	1292	13	170	35	11	0	0	21.9
San Lawrenz	9.37	3	89.8	25	95.1	571	171	2	83	7	0	12	134	11.8
Marsascala	7.34	5	152.4	28	75.1	10812	2057	20	79	41	12	60	20	13.5
Attard	2.27	7	140.5	21	75.2	10517	1590	34	111	3	13	0	29	26.3
Munxar	9.29	3	87.4	16	87.5	986	378	2	74	21	7	24	40	8.7
San Gwann	4.89	1	44	36	39.0	2920.0	2718	23	47	20	6	0	54	8.4
Marsaxlokk	2.28	5	206.8	43	85.3	3344	714	7	86	26	23	0	0	12.5
Fontana	1.8	0	7.7	16	78.7	871	1862	17	19	8	9	0	66	5
Għasri	9.67	4	127.2	25	92.4	383	86	4	63	22	6	0	0	7.5
Mtarfa	0.85	1	56.6	80	99.3	2560	3560	0	11	10	10	0	0	25.8
Kalkara	1.69	2	34.1	18	65.3	2904	1675	1	36	6	1	0	0	6.7
Iklin	1.87	2	22.5	13	71.5	3145	1836	1	6	0	0	0	20	8.8
Santa Lucija	0.74	1	20.2	28	58.5	2947	4112	0	16	0	0	0	0	2.6
Mdina	6.44	1	14.2	15	61.1	218	270	1	10	0	0	0	0	0.436

Table 2: Profile of rural localities as of 2006 together with the key indicators.
Source: (a) NSO 2016. Demographic Review 2014 (b) Rural Development Programme for Malta 2004–2006 (c) Census of Agriculture 2001 (d) NSO unpublished data.

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	Agric Area	Full-time farmers	Part-time farmers	Total Farmers Population	% Farmers	Population Density	Sheep	Goat	Layer	Kitchen Gardens
Agric. Area	1									
Full-time farmers	0.83	1								
Part-time farmers	0.84	0.73	1							
Total Farmers Population	0.87	0.79	0.99	1						
% Farmers	0.35	0.19	0.30	0.30	1					
Population Density	-0.28	-0.02	-0.16	-0.14	-0.71	1				
Sheep	0.77	0.62	0.87	0.87	0.38	-0.27	1			
Goats	0.46	0.43	0.68	0.66	0.11	-0.03	0.81	1		
Layers	0.31	0.50	0.52	0.54	0.00	0.21	0.28	0.27	1	
Kitchen Gardens	0.74	0.66	0.90	0.89	0.18	-0.13	0.78	0.60	0.50	1

Table 3: Multiple correlation analysis.

Locality	Part-time farmers	Sheep	Kitchen Gardens	Total Population	Ranking
Rabat (Malta)	1168	250	110.9	10943	100.00
Siġġiewi	729	209	125.7	8210	66.15
Żurrieq	654	159	99.1	10286	57.33
Mosta	713	54	115.8	19273	54.09
Żebbug (Malta)	592	139	76.4	11468	51.55
Żejtun	548	128	51.3	11147	47.67
Mellieħa	554	118	103.1	7935	47.39
Nadur	449	139	65.9	3851	41.47
Xagħra	444	103	59.6	3770	38.58
Żabbar	411	85	48.8	14709	34.98
Mġarr	356	118	44.7	3450	33.43
Xewkija	306	167	42.6	3089	33.36
Birżebbuġa	354	81	54.4	8397	30.68
Dingli	314	81	54	3561	27.86
Victoria	284	76	37.2	6075	25.39
Ta' Sannat	248	107	80.2	12766	25.04
San Pawl il-Baħar	302	49	85.3	14054	24.75
Qormi	266	65	52.1	15958	23.34
Għaxaq	222	88	33	4606	21.86
Luqa	260	34	37.6	5621	20.73
Qrendi	270	22	34	2641	20.59
Ta' Kerċem	200	55	39.9	1681	17.98
Gudja	219	36	13.4	3007	17.98
Kirkop	160	67	13.6	2297	16.01
Żebbug (Gozo)	184	25	41.5	1732	14.74
Għargħur	170	35	21.9	2557	14.46
Naxxar	132	63	20.2	1779	13.75
Safi	165	30	21.3	2066	13.75
Mqabba	149	44	33.2	3236	13.61
Qala	139	46	20.4	1703	13.05
Għajnsielem and Comino	133	43	24.6	2563	12.41
Għarb	114	50	18.6	1150	11.57
Marsascala	79	41	13.5	10812	8.46
Attard	111	3	26.3	10517	8.04
Marsaxlokk	86	26	12.5	3344	7.90
Lija	99	4	18.5	11809	7.26
Munxar	74	21	8.7	986	6.70
San Lawrenz	83	7	11.8	571	6.35
Għasri	63	22	7.5	383	6.00
San Gwann	47	20	8.4	2920	4.73
Kalkara	36	6	6.7	2904	2.96
Fontana	19	8	5	871	1.90
Mtarfa	11	10	25.8	2560	1.48
Santa Luċija	16	0	2.6	2947	1.13
Mdina	10	0	0.436	218	0.71
Iklin	6	0	8.8	3145	0.42
Xgħajra	3	0	3.7	1601	0.21

Table 4: Ranking of localities.

3.7 Full-time farmers

Full-time farmers are significantly fewer in numbers than part-timers and are commercially oriented to deliver produce to markets. Their focus may not permit them in terms of time and effort to take up pluriactivity as this would deviate them from crop production. This indicator has a moderate coefficient of correlation with sheep, layers, and kitchen gardens all of which are strongly associated with the provision of basic materials used in rural home cooking.

3.8 Part-time farmers

Part-time farmers have a stronger positive correlation than full-time farmers with the number of sheep, goats, layers, and kitchen gardens. This is quite a relevant outcome, given that the number of part-time farms far outnumbers that of full-timers and hence has a greater influencing potential on the rural food culture. While major advances in crop production were confined by the unavailability of water and lack of improved management and technology, the not so constrained but intensive livestock sector fared better but remained dependent on feed imports. Fragmentation has also led to a predominance of tiny rural holdings. This combination of factors could thus have led to the predominance of part-timers, representing 90% of total farmers, by 1991. As of 2020, 11,713 part-timers represented 87% of total farmers. Apart from constraints imposed by climatic and geophysical factors, human activity in the Maltese Islands has played a central role in the shaping of agriculture, and the prevailing situation is not indicative of an evolving process synonymous with change, but of essentially traditional agriculture which, while reflecting certain changes because of socioeconomic interaction, has not undergone many radical transformations (Meli, 1994). The results indicate that this group of farmers is strongly correlated with kitchen gardens—hence the provision of seasonal fruit and vegetables for consumption at home and by the extended family. The fact that they are also correlated to sheep, goats, and layers may also infer that apart from horticultural production, they may also indulge in livestock production to be more self-sufficient. Although backyard rabbit production is not captured in the national statistics, one could safely assume that this segment includes small rabbit units comprised of up to 10 does kept for home consumption. The rabbit is well entrenched into Maltese cuisine, culture, and traditions, so much so, that the Maltese national dish is cooked rabbit known as 'Stuffat tal Fenek' (Cassar, 1994, 2016; De Battista, 1985).

3.9 Small Ruminants: Sheep and Goats

Malta's indigenous breeds of sheep and goats has always constituted a backyard industry since the production of sheep and goats' milk is for the production of cheeselets (Ġbejna) eaten fresh, dried or peppered. Additionally, culled animals, lambs, and kids also contribute to the food culture as mutton, lamb, and kid meat. The products of this industry are usually intended for home consumption on an 'extended' family basis or sold within the neighbourhood if in surplus. The ġbejna is an important element in several traditional dishes and is popular in various cheeselet-based dishes such as ravioli, qassatat, pastizzi, and torta tal-ġbejniet. The consumption of lamb and mutton dishes prevails during the Easter period. The significant discrepancy in the coefficient of correlation between sheep and goats with part-time farmers needs addressing. Historically, sheep have always outnumbered goats, a situation that is also relevant today (Tables 1 and 2), with a sheep population that is roughly three-fold that of goats. However, this fact alone does not explain why sheep correlate with a coefficient of 0.87 with part-time farmers while goats feature at 0.68. This discrepancy between the two populations is probably because the current goat population includes a significant group of recently introduced goats, such as the pygmy goat, that are not kept for their milk, but rather are kept as pets.

3.10 Poultry: Layers and Broilers

Eggs and poultry meat also formed part of the local gastronomy, so much so that Cesareo (1950) states that the Maltese Black, an indigenous breed of chicken served as a rustic, dual-purpose breed capable of producing adequate egg and chicken for consumption. While eggs find their way into local cuisine in standalone dishes such as balbuljata, which is made with beaten eggs and tomatoes, they are also frequently incorporated as a binder for recipes based on flour, and cheese, while poultry meat was served on special occasions or used to make broth to be given to the sick. MacGill (1839) captures both in his description of the Maltese weddings, stating on pages 29–30:

> 'The families of the peasantry invited to one of these weddings bring in their horgia, a fowl or capon, prepared for the pot with a distinguishing sign, attached to it; a large loaf, and one or more bottles of wine: a kettle or boiler is provided, into which the whole of the volatiles are thrown, and at the appropriate time a quantity of paste or vermicelli, (provided by the father of the bridegroom,) with other condiments, is put into the pot; which forms an excellent soup or minestra. Now comes a scene of enjoyment hurry-scurry and excitement; a friend of the

> bridegroom presides over the boiling cauldron, dives a large fork into it, and holds up the produce to the excited party; each knowing his distinguishing mark, claims it as his property, and carries it off.'

Although poultry occupies a role in local cuisine, results indicate very poor correlation coefficients. The fact that broilers do not feature in the correlation analysis, and that layers are only just correlated with part-time farmers and kitchen gardens suggests that these indicators have moved away from the pure rural context. A potential interpretation could be that small flocks need minimal housing requirements and can easily be bred by people who are not part-time farmers or have access to kitchen gardens. Feed, the one element that would link poultry with kitchen gardens are easily purchased from the two major feed mills and other outlets, abolishing the need to resort to kitchen gardens. Additionally, it has been observed that broiler production typically follows a cobweb cycle with new entrants after a year of high prices and fewer producers after a bad year by part-time amateurs.

3.11 Kitchen Gardens

According to the survey on kitchen gardens in Malta (National Statistics Office, 2005), the large majority of agricultural holdings are a family concern that directly supports the farmer's household without producing a significant surplus for trade. The produce from these holdings is not sold at the official markets, as is normal practice with commercial agricultural holdings. Since traditions are passed on from one generation to the next, one would expect that the aspect of home cooking would also follow the same form of transmission. Piscopo (2004) further identified that grandparents have an important role in promoting and exposing their grandchildren to traditional food. Hence, as far as food is concerned, one can venture to say that it is usually mothers who transfer recipes to their children and grandchildren, from one generation to the next.

3.12 Ranking

Since results indicate that part-time farmers contribute most towards retaining rural food production and consumption habits, the indicators having a high coefficient of correlation with part-time farmers were used to formulate the ranking of the rural localities most likely having a high percentage of its population that still resorted to rural food preparation. In this context, references to food consumption relate to the rural fare provided by market gardeners and small livestock producers. The calculation for each location is as follows:

$$\frac{\left(\frac{\sum \text{of Part-time farmers, Sheep and Kitchen Gardens}}{\text{total population of the location}}\right)}{\text{highest value}} \times 100 \quad (2)$$

This ranking is based on the degree of exposure per inhabitant of that particular locality to the selected indicators. The results presented in table 4, indicate that the Rabat (Malta), Siġġiewi, Żurrieq, Mosta, and Żebbug (Malta) cluster of the top five locations that have a population that is most likely still exposed to the traditional way of cooking and food habits, while Mtarfa, Santa Luċija, Mdina, Iklin and Xgħajra are at the bottom of the rank. This ranking clearly supports the concept that the rural and urban areas need to be considered as extremes of a gradient with various landscapes being a mosaic that combine rural and urban land.

4 Conclusion

A very comprehensive definition of traditional food is given by Guerrero et al. (2009): 'A product frequently consumed or associated with specific celebrations and/or seasons, normally transmitted from one generation to another, made accurately in a specific way according to the gastronomic heritage, with little or no processing/manipulation, distinguished and known because of its sensory properties and associated with a certain local area, region or country.' This definition indicates that cuisine and food production forms part of a country's cultural identity and traditions. In this day and age of globalization, the rediscovery of "tradition foods" is a response to the deep-rooted desire for reassurance and story-telling (Geyzen et al., 2012). It is also important to note that the concept of traditional food within modern lifestyles is particularly diffused and fluid (Amilien & Hegnes, 2013) and is being adopted in a loosely manner by food writers, chefs, food marketers, and policy makers. The complexities of the "tradition" concept can be presented on four underlying axes, i.e.

1. geographical origin,
2. historical use,
3. specificities of artisan production and culinary skills, and a more longwinded aspect of,
4. overall story-telling.

In agreement with this, Buttigieg (2014) argues that Malta's regional characteristics should be seriously taken into consideration when conducting food culture surveys. In support of this argument, this study has showed that rather than conceptualising the Maltese rural and urban

areas as two separate entities, they should be characterised along a gradient with the pure rural and urban at the extremities at opposite ends.

This study indicates that rural affinity is best evaluated by the parameters part-time farmers, the number of sheep in small holdings, and kitchen gardens. Future studies on Maltese typical cullinary culture should include these parameters for consideration in the identification and selection of locations to include in their research. A ranking across a gradient of the Maltese rural location has been accordingly tabled. These results can serve as a guideline in selecting appropriate locations on which to conduct surveys to evaluate the consumption patterns of traditional Maltese rural fare. Furthermore, in line with the findings of Inguanez and Ellul (2018) and those of Tessier and Gerber (2005) and Piscopo (2004), surveys could be conducted by focusing on the adult population attending Sunday mass.

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