

Original Article

Commodities consumed in Italy, Greece and other Mediterranean countries compared with Australia in 1960s and 1990s

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Consumption figures for 15 major commodities (cereals, wheat, rice, maize, potato, pulses, olive oil, other vegetable oils, vegetables, fruits, wine, meats, animal fats, milk + products, and fish + seafood) were collected from FAO Food Balance Sheets during the 1960s (1961-1969) and late 1990s (1995-1999). For some nutritionists the "model Mediterranean diet" is the Italian or Greek diet of the 1960s, for others the concept of Mediterranean countries is more general. Analysis shows: (1) In the 1960s, Australia consumed more meat, milk, animal fat than Italy or Greece and less cereals, wheat, pulses, olive oil, vegetables, fruits and wine. (2) In the 1960s, Australia's olive oil, vegetables, fruits and wine consumption were within the range for all 18 Mediterranean countries (i.e. Spain, France, Italy, Malta, Croatia, Bosnia, Albania, Greece, Cyprus, Turkey, Syria, Lebanon, Israel, Egypt, Libya, Tunisia, Algeria and Morocco). (3) In the 1990s, food consumptions have evolved; Australia's wine and milk consumption is now similar to Italy and Greece; consumption of wheat, olive oil, vegetables, fruits and fish are lower; consumption of potato, pulses, other vegetable oils and meat are higher than Italy or Greece. (4) Australia's consumption of the 15 commodities is within the range of all Mediterranean countries in the late 1990s, except wheat consumption was lower.

Key Words: Mediterranean diet, Italy and Greece diets; Australian food consumption, FAO Food Balance Sheets

Introduction

As part of our study of Mediterranean diets and their influence on Australian food habits, data were collected from FAO Food Balance Sheets for the 18 countries on or in the Mediterranean Sea for the years 1961-1999. Data in the FAO Food Balance Sheets provides the best available comparative objective data for the food used by the whole population of a country.

The consumption figures for each commodity were obtained by dividing the food available for human consumption figure by the total population consuming it during the reference period. The estimate of the total population is a part of ongoing official statistics. This is macro data and should be more consistent and standardized than small periodic nutrition intake surveys (which are not available for all the countries) or personal opinions (of which there are plenty on the subject of "Mediterranean diet"). However, for many countries, these food consumption figures may also be subject to incomplete or unreliable data.

As FAO says, the Food Balance Sheets do not of course give any indication of the differences that may exist in the diet consumed by different individuals or population groups e.g., people from different socio-economic groups, or geographical areas within a country.

It is important to take into account that the quantities of food available for human consumption, as estimated in the food balance sheet, reflect only the quantities reaching consumers. The amount of food taken in by individuals should be lower than the quantities shown in the Food Balance Sheets, depending on the amount of losses of edible food before reaching the household, in the household (e.g., during storage, in preparation and cooking, as plate-waste, fed to domestic animals or thrown away) and fed to international visitors. On the other hand, waste on the farm and during distribution and processing is taken into consideration in the Food Balance Sheets.

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We have collected Food Balance Sheets (FAO) for 15 main food groups to compare Australian consumption with that of Mediterranean countries. For some scientists "the Mediterranean diet" is that of Italy or of Greece in the 1960s, for others the concept is more general. We have therefore compared Australian consumption in the 1960s (1961-1969) with Italy (1961-1969), Greece (1961-1969), and the range of 18 Mediterranean countries consumption including Italy and Greece. In clockwise order, these are Spain, France, Italy, Malta, Croatia, Bosnia, Albania, Greece, Cyprus, Turkey, Syria, Lebanon, Israel, Egypt, Libya, Tunisia, Algeria and Morocco, also in 1961-1969.

Consumption patterns have changed, so we looked at consumption data for the late 1990s (1995-1999), the most recently published by FAO for Italy, for Greece, for Australia and the range for all 18 Mediterranean countries again (Spain, France, Italy, Malta, Croatia, Bosnia, Albania, Greece, Cyprus, Turkey, Syria, Lebanon, Israel, Egypt, Libya, Tunisia, Algeria and Morocco).

Materials and methods

The consumption of 15 commodities: cereals, wheat, maize, rice, potato, pulses, olive oil, other vegetable oils, vegetables, fruits, wine, meat (including offal), animal fats (including butter and ghee), milk + products (including cheese) and fish + seafood in 18 Mediterranean countries: Spain, France, Italy, Malta, Croatia, Bosnia, Albania, Greece, Cyprus, Turkey, Syria, Lebanon, Israel, Egypt, Libya, Tunisia, Algeria and Morocco from 1961-1999 were examined. FAO Food Balance Sheets¹ were the source of data, which is all expressed in kilograms/head/year.

In table 1, further data is assembled as follows: -

Column 1: Italy's average consumption for the 8 years, 1961-1969.

Column 2: Greece's average consumption for the 8 years, 1961-1969.

Column 3: Australia's average consumption for the 8 years, 1961-1969.

Column 4: the range of the commodities' consumption across all 18 Mediterranean countries over the 8 years 1961-1969.

Column 5: Italy's average consumption for the recent years, 1995-1999.

Column 6: Greece's average consumption for the recent years, 1995-1999.

Column 7: Australia's average consumption for the recent years 1995-1999.

Column 8: the range of the commodities' consumption across all the Mediterranean countries over mostly recently reported years (1995-1999).

Figure 1. illustrates Italy's, Greece's and Australia's average consumption of the 15 commodities during the 1960s (1961-1969). Figure 2. shows Italy's, Greece's and Australia's consumption of the 15 commodities averaged over the years 1995-1999. In the Appendix is our shortened version of the FAO definitions of each commodity group.

Results

Comparisons of average consumption in Italy, Greece and Australia in the 1960s

I. Italy and Greece (1961-1969)

Many nutritionists have selected food consumption of Italy and/or Greece in the 1960s as the model Mediterranean diet. In Table 1, comparing Italy (*column 1*) and Greece (*column 2*) in the 1960s, in Italy, average consumption of cereals, wheat, maize, potato, other vegetable oils, wine, animal fat and milk were higher than the consumption in Greece. Greece's consumption was, however, higher for pulses, olive oil, vegetables, fruits and fish. The biggest differences were in olive oil (much higher in Greece) and wine (3.5 times higher in Italy).

II. Australia compared with Italy + Greece (1961-1969)

Comparison of Australia's average consumption (*column 3*) with Italy (*column 1*) and Greece (*column 2*) in the 1960s shows that Australia's consumption of cereals and wheat was below the consumption of Italy and Greece. Australia's consumption of pulses, olive oil, vegetables, fruits and wine were well below Italy and Greece. Australia's meat, animal fat and milk consumption were above Italy and Greece.

III. Australia compared with the range of 18 Mediterranean countries (1961-1969)

Comparison of Australia's consumption (*column 3*) with the range of all Mediterranean countries (*column 4*) in the 1960s shows that Australia's cereals and pulses consumption was below and outside the range of all Mediterranean countries. Australia's consumption was within the range for wheat, rice, maize, potato, other vegetable oils, olive oil, vegetables, fruits, wine and fish. Australian's wine consumption was below that of 5 Mediterranean countries and above that of 11 countries. Australia's meat, animal fat, and milk consumption were above and outside the range of all the Mediterranean countries during the 1960s.

Changes in consumption from the 1960s to the late 1990s

I. Italy from 1960s to 1990s

In Italy, between the 1960s and 1990s, average consumption of cereals decreased from 179 to 159 (kg/h/y), wheat from 166 to 149, maize from 6 to 4 (kg/h/y), potato from 47 to 38 (kg/h/y). Wine consumption decreased markedly to half of the 1960s consumption, from 110 to 56 (kg/h/y). Italy's average consumption of other vegetable oils increased twofold from 6 to 14 (kg/h/y), meat from 44 to 91 (kg/h/y) and animal fat from 4 to 11 (kg/h/y) through 1995-1999.

II. Greece from 1960s to 1990s

In Greece from the 1960s to the 1990s, cereals consumption decreased a little from 160 to 150 kg/h/y, wheat from 152 to 138 kg/h/y, pulses decreased from 8 to 5 kg/h/y, while wine decreased notably from 32 to 18 (kg/h/y). On the other hand, Greece's consumption of rice increased from 5 to 7 kg/h/y, and potato from 40 to 69 kg/h/y. Olive oil was much the same, 16 to 18 kg/h/y, fruits increased a little from 133 to 151 kg/h/y. Other vegetable oils increased greatly from 2

Table 1. Average of commodities consumption in Italy, Greece and Australia (kg/head/year)

Commodities	1961-1969				1995-1999			
	1 Italy	2 Greece	3 Australia	4 Range of all 18 Mediterranean countries	5 Italy	6 Greece	7 Australia	8 Range of all 18 Mediterranean countries
Cereals	179	160	108	118-203	159	150	88	100-250
Wheat	166	152	100	74-166	149	138	72	89-210
Rice	5	5	3	0.3-9	6	7	8	0.9-40
Maize	6	2	3	0.1-88	4	2	5	0.9-97
Potato	47	40	46	3-105	38	69	59	22-113
Pulses	6	8	0.7	2-13	6	5	8	2-12
Olive oil	10	16	0.4	0-16	12	18	1	0-18
Other vegetable oils	6	2	4	1-11	14	19	17	3-19
Vegetables	148	153	64	42-153	176	276	90	84-305
Fruits	112	133	82	30-152	123	151	86	33-226
Wine	110	32	6	0.1-115	58	18	19	0-62
Meat+offal	44	35	118	11-89	91	86	115	20-117
Animal fat	4	2	15	0.8-11	11	3	6	1-19
Milk (excluding butter)	160	133	255	28-224	256	262	239	43-287
Fish+seafood	15	20	14	0.2-20	23	26	20	1-41

to 19kg/h/y and vegetables from 153 to 276 kg/h/y. Meat consumption more than doubled from 35 to 86 kg/h/y, animal fat from 2 to 3 kg/h/y and milk increased from 133 to 262 kg/h/y.

III. Australia from 1960s to 1990s

Australia's consumption of cereals decreased from 108 to 88kg/h/y, wheat from 100 to 72 kg/h/y, and meat was much the same from 118 to 115 kg/h/y. There was a marked decrease in animal fat from 15 to 6 kg/h/y. Pulses however increased greatly from 0.7 to 8 kg/h/y, other vegetable oils from 4 to 17 kg/h/y and wine consumption and from 6 to 19 kg/h/y. There was a doubling in olive oil from 0.4 to 1 kg/h/y (but still small), vegetables increased from 64 to 90 kg/h/y.

Comparisons of averages in Italy, Greece and Australia in the 1990s

I. Greece and Italy (1995-1999)

It can be seen in the table, comparing Italy (*column 5*) and Greece (*column 6*) through the recent years, that in Italy average consumption of wheat was a little higher, maize was double Greece's consumption. Other vegetable oils, wine, meat, and animal fat were higher in Italy than Greece's consumption. Italy had lower consumption of potato, olive oil, vegetables and fruits. Milk and fish consumptions were much the same in Italy and Greece.

II. Australia compared with Italy + Greece (1995-1999)

Comparison of Australia's average consumption (*column 7*) in the late 1990s with Italy (*column 5*) and Greece (*column 6*) shows that Australia's consumption of cereals, wheat, olive oil, vegetables, fruits and fish were lower than in Italy and Greece. Australia's potato consumption was higher than

Italy, lower than Greece. Australia's consumption of pulses, other vegetable oils and meat were higher than in either Italy or Greece. In the 1990s, Australia's consumption of wine was the same as in Greece (which has come down since the 1960s) but still much lower than Italy's. Also, Australia's milk consumption was 'now' the same as in Italy and Greece.

III. Australia and the range of 18 Mediterranean countries (1995-1999)

By 1995-1999, comparison of Australia's consumption (*column 7*) with the range of all Mediterranean countries (*column 8*) shows that Australia's cereals and wheat consumption was still below and outside the range. Australia's consumption was within the range for rice, maize, potato, pulses, vegetables, fruits, wine, animal fat, milk and fish. Olive oil was within the range near the lower end, meat was within the range, very near the top. Other vegetable oils were within the range, above Italy and below Greece.

Discussion

In the 1960s Australia consumed more meat, milk and animal fat than Italy or Greece and less cereals, wheat, pulses, olive oil, vegetables, fruits and wine. Australia's rice, maize, potato, other vegetable oils and fish consumptions were similar to that of Italy and Greece.

Australia's olive oil, vegetables, fruits and wine consumption were within the range for all 18 Mediterranean countries, so that only Australia's cereals and pulses were below the Mediterranean range, and meat, milk and animal fat above the Mediterranean range. In the three decades to the late 1990s, consumption patterns changed in Italy and Greece.

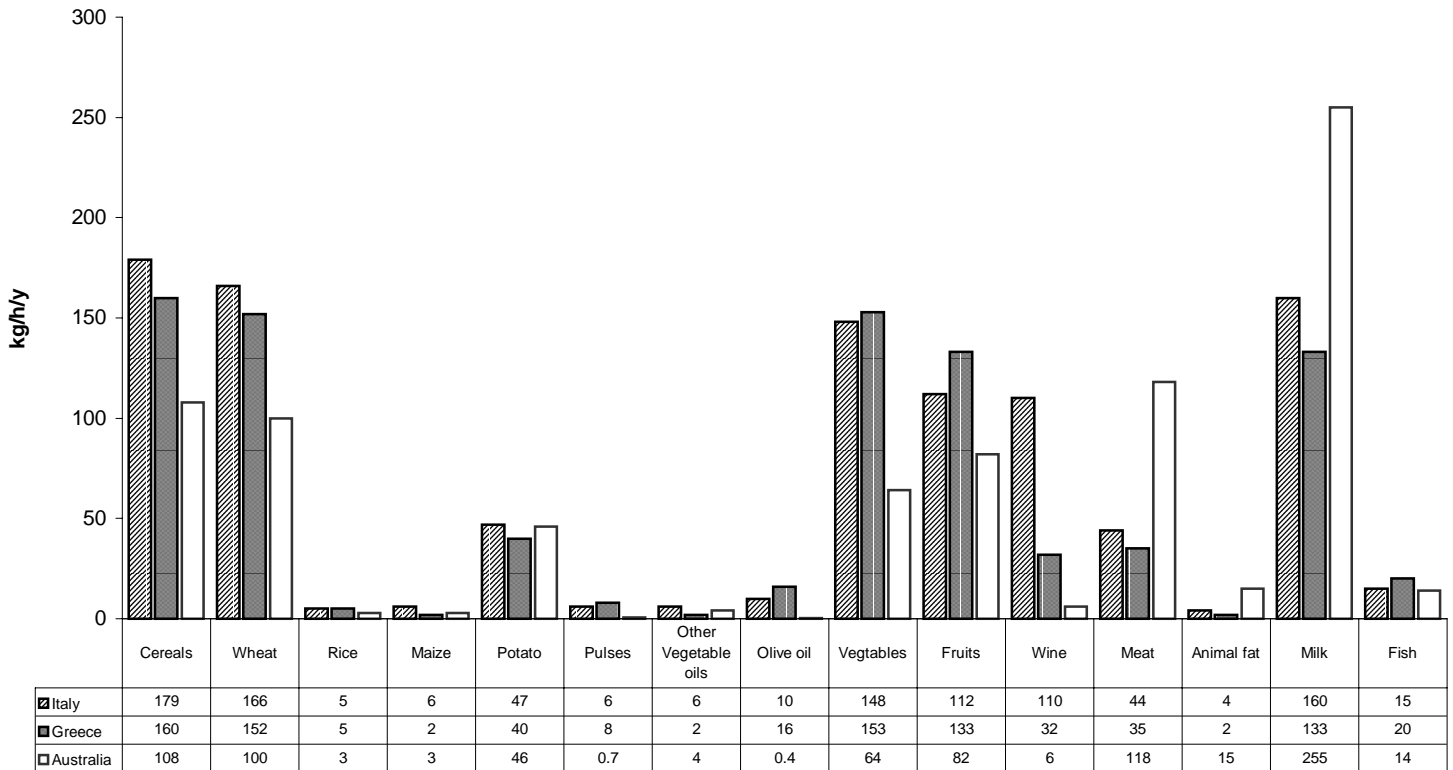


Figure 1. Average consumption of Italy, Greece and Australia (1961-1969)

The biggest changes were increases in other vegetable oils, meat and milk (in both), vegetables (especially in Greece) and striking decreases in wine consumption (in both). Meanwhile Australia's consumption has changed. Total cereals and wheat are down further, rice, maize and pulses, potato and vegetables have increased. Other vegetable oils and wine consumption have both increased greatly; olive oil has doubled, though still small, and animal fat is much lower.

Comparing Australia with Italy and Greece in the late 1990s, consumption of cereals, wheat, olive oil, vegetables and fruits are still lower than in Italy and Greece, but Australia's wine consumption is about the same as in Greece; Australia now consumes more pulses than Italy and Greece. Other vegetable oils are between Italy and Greece. Meat remains higher in Australia but not so much higher as before and milk is a little lower in Australia.

Against the range of all 18 Mediterranean countries in the late 1990s, Australia's consumption is only outside (below) the range for cereals and wheat. For the other 13 commodity groups, Australia's most recently documented consumption is within the range of all Mediterranean countries.

Comparison of commodity consumption in Australia, as an example of a western type affluent (but not Mediterranean country) country with Italy and Greece using FAO figures in the 1960s confirms some of the general statements about Mediterranean diets, that they were relatively high in cereals,

pulses, vegetables, fruits, olive oil and wine, and low in meat, animal fat and dairy food.¹⁻¹²

The other 16 countries around or in the Mediterranean Sea did not, however, all have the same food and drink patterns as Italy and Greece. In some of these *other* Mediterranean countries, the consumption of wheat, rice, maize, potato, vegetables, fruits, even olive oil, wine and fish were lower than in Australia.

By the late 1990s, the differences between Australia and Italy + Greece had disappeared for pulses, wine and milk and diminished for meat consumption. Australia's consumption of the 15 commodities is now within the range of all Mediterranean countries except for total cereals and wheat (low). Australia's late 1990s food consumption patterns could also be compared with Italy and Greece back in the 1960s. If this criterion is used, Australia could not be said to have a Mediterranean diet, but Australian consumption is mostly within the range of all 18 Mediterranean countries in the 1990s (only outside the range in low wheat consumption)

The interest in the Mediterranean diet started because of the low rates of coronary heart disease in Italy and Greece in the 1960s, discovered by Ancel Keys,¹³ and demonstrated in the Seven Countries Study.^{13,14} Yet the present life expectancy at birth in Australia is longer than in any Mediterranean country¹⁵ and so is the healthy life expectancy.¹⁶

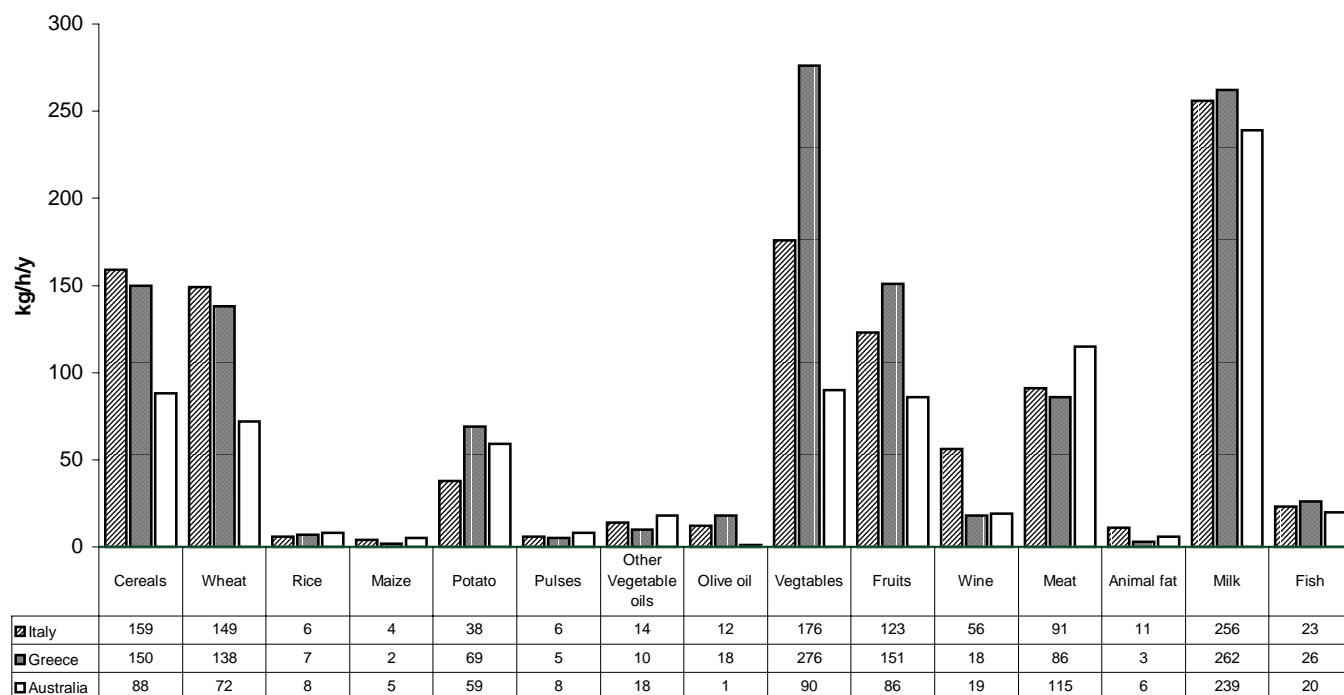


Figure 2. Average consumption of Italy, Greece and Australia (1995-1999)

Even more surprising, according to demographic yearbook 1961-169,¹⁷ is that the life expectancy at birth in Italy and Greece 1960-1962 were shorter than Australian at that time.

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Appendix: FAO's Commodities definition and classification

Total cereals (excluding beer)

Cereals for FAO referred to crops harvested for dry grain only. This definition covers primary cereals: *wheat*, flour of wheat, bran of wheat, macaroni, germ of wheat, bread, bulgur, pastry, starch of wheat, wheat gluten, *rice*, *maize*, popcorn, *rye*, *oats*, *sorghum*, buckwheat, quinoa, fonio, canary seed, mixed grain (flour and bran), cereals not elsewhere specified.²

Potato

According to FAO this is one of seven primary root and tuber crops and defined as a seasonal crop grown in temperate zones all over the world, but primarily in the northern hemisphere. Roots and tubers are plants yielding starchy roots, tubers, rhizomes, corms and stems. They are used mainly for human food (in processed form), for animal feed and for manufacturing starch, alcohol and fermented beverages including beer.³ The denomination "roots and tubers" excludes crops which are cultivated mainly for feed (mangolds, Swedes) or for processing into sugar (sugar beets), and those classified as "roots, bulb and tuberous vegetables" (onions, garlic

Pulses

For FAO the term "pulses" is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food (green peas, green beans, etc.), which are classified as vegetable crops. Also excluded are those crops used mainly for oil extraction (e.g. soybean and groundnuts) and leguminous crops (e.g. seeds of clover and alfalfa) that are used exclusively for sowing purposes. FAO Food Balance Sheets cover 11 primary pulses including Beans, dry *Phaseolus spp.*: kidney, haricot bean (*Ph. vulgaris*); lima, butter bean (*Ph. Lunatus*) scarlet runner bean (*Ph. coccineus*); Broad beans, dry *Vicia faba*, field bean. Peas, dry garden pea (*Pisum sativum*); *field pea* (*P. arvense*). Chickpeas, Bengal gram, garbanzos (*Cicer arietinum*). Lentils (*Lens esculenta*). Only two processed products are included in the FAO list, namely flour of pulses and bran of pulses.⁴

Vegetable Oils and Fats

Vegetable oils have a wide variety of food uses, including salad and cooking oils, as well as the production of margarine, shortening and compound fat. They also enter into many processed products, such as mayonnaise, potato chips, French fries, salad dressing, sandwich spread and canned fish. For FAO Food Balance Sheets⁵ vegetable oils include olive oil, soybean, sunflower seed, palm kernel, palm, copra, and cottonseed and sesame seed oils.

Olive oil:

According to FAO, olive oil is obtained from olives by mechanical or other physical means. Olive's oil is the only

vegetable oil that can be consumed without refining. Other vegetable oils were calculated as total vegetable oils minus olive oil.

Vegetables (excluding potato)

For FAO vegetables as classified in this group are mainly annual plants cultivated as field and garden crops in the open and under glass, and used almost exclusively for food. Vegetables grown principally for animal feed or seed should be excluded. Certain plants, normally classified as cereals and pulses, belong to this group when harvested green, such as green maize, green peas, etc. This grouping differs from international trade classifications for vegetables in that it includes melons and watermelons, which are normally considered to be fruit crops. But, whereas fruit crops are virtually all-permanent crops, melons and watermelons are similar to vegetables in that they are temporary crops. Chillies and green peppers are included in this grouping when they are harvested for consumption as vegetables and not processed into spices. FAO production data for green peas and green beans refer to the total weight including pods, although some countries report on a shelled weight basis. The weight of the pods ranges from 40 to 50 percent for peas to up to 70 percent for broad beans. Area data on small vegetable gardens are often omitted in agricultural surveys, although production estimates may be reported. Trade data for fresh vegetables also include chilled vegetables, meaning the temperature of the products has been reduced to around 0°C without the products being frozen.⁶

Fruits (excluding wine)

Fruit crops consist of fruits and berries that, with few exceptions, are characterized by their sweet taste. Nearly all are permanent crops, mainly from trees, bushes and shrubs, as well as vines and palms. Some fruits have a high fibre content and other inedible components so that wastage is high, eg 60% for passion fruit and 35-40% for pineapple. The waste in temperate zone fruit is lower, generally of the order of 10-15 percent, while berries contain very little waste. Fruit crops are consumed directly as food and are processed into dried fruit, fruit juice, canned fruit, frozen fruit, jam, alcoholic beverages, etc. FAO lists 36 primary fruit crops including oranges, mandarins, lemons, limes, grapefruit, other citrus, bananas, apples (excluding cider), dates, grapes (excluding wine) and other products not elsewhere specified or included.⁷

Beverages

FAO classifies the beverages to include five main groups of commodities that differ by source, use, and nutritive value and in their commercial importance. Of the beverages, only wine consumption is selected here.⁸

Wine

FAO describes wine as wines of fresh grapes of all qualities, including sparkling, fortified and dessert wines:

Meats (including offal)

FAO defines meat as the flesh of animals used for food. In production data meat is normally reported inclusive of bone and exclusive of meat that is unfit for human consumption. As reported by all the countries, meat production data may refer either to commercial production (meat entering marketing channels), inspected production (from animals slaughtered under sanitary

inspection), or total production (the total of the above mentioned categories plus slaughter for personal consumption). All FAO annual production data refer to total production. Meat includes beef and

veal, mutton and goat meat, pig meat, and poultry. Meat also includes edible offal (e.g. tongue, liver, heart, etc.), chilled and frozen meat, cured meat (e.g. bacon and ham), sausages and other preserved meats.⁹

Animal Fats (including butter and ghee)

This includes animal fats that are obtained in the course of dressing the carcasses of slaughtered animals (slaughter fats), or at a later stage in the butchering process when meat is being prepared for final consumption (butcher fats). It includes butter and similar products obtained from milk. Processed animal fats include lard obtained by melting raw pig fat and tallow obtained from raw fat of other animal species. Animal fats are largely used in the production of margarine, shortening and compound fat. They also enter into many-processed food products.¹⁰

Milk + Products (including cheeses)

FAO classifies milk + products as cow milk, skimmed milk of cow, condensed whole milk, condensed whey, yogurt, buttermilk curd, evaporated whole milk, evaporated skim milk, cheese whole cow milk, cheese skimmed milk, processed cheese, ice cream, casein, buffalo milk, sheep milk and cheese, goat milk and cheese, and finally camel milk.¹¹

Fish + Seafood

According to FAO, aquaculture in the Mediterranean region is primarily the culture of shellfish (65% of the 1986 total); the rest is practically all finfish culture in freshwater and slightly brackish water (21%) and culture of salmonids (14%). Furthermore, the Mediterranean fish +seafood consumption includes the higher value species such as sea-bass, redfish, sea bream, trout, sole, flounders, mullets, sardines, clams and seafood such as oyster, mussels and shrimps.¹²

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