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**The Consumption of Spices and Their Costs in Late-Medieval and Early-Modern Europe:  
Luxuries or Necessities?**

The following lecture was originally delivered under the title: *The Luxury Trades of the Silk Road: How Much Did Silks and Spices Really Cost?* It was delivered to the Royal Ontario Museum Continuing Education Symposium (University of Toronto): *Silk Roads, China Ships*, on 12 October 1983.

It was subsequently delivered in the revised form that appears below as: ‘Oriental Spices and Their Costs in Medieval Cuisine: Luxuries or Necessities?’ A lecture delivered to the Canadian Perspectives Committee, Senior Alumni Association, University of Toronto, at University College, 8 November 1988.

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N.B. The graphs referred to in this text have not been reproduced in this document; but some tables have been added that were not in the original lectures (the most recent in November 2001). However, more graphs, tables, and maps may be accessed from my on-line lectures for Economics 301Y, for medieval Mediterranean (Venetian) trade, for 16 November 2005, at this URL:

<http://www.economics.utoronto.ca/munro5/lecnot301.htm>

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**1. Introduction:**

I must first begin with a disclaimer. My interest in spices, medieval and modern, is much more amateur than professional, and I do not claim to be an authority on the medieval spice trades.

a) My predominantly amateur interest in spices owes its origins, however, to my professional beginnings, in my mid 20s, doing research in London's Public Record Office. I soon discovered something much more unpleasant than English weather and London smog: English food, that is English food cooked to death by Englishman. On the advice of friends, I quickly found salvation in a wide variety of spicy foods, cheaply priced in London's ubiquitous Italian and Asian restaurants; and I soon settled especially on Indian food -- though I still love all forms of Asian, Middle Eastern, and North African foods.

b) Coming back to Canada, I tried to imitate Indian cooking with absolutely abysmal, disastrous

results, until a lady-friend took pity on me -- or more likely on her own stomach -- by giving me as a Christmas present what is still by far the most used of my dozen or more Indian and Oriental cookbooks: *The Art of India's Cookery* (by Saraswathi Lakshmanan, 1964). Later, on this screen, I shall show you some of its recipes.

c) Cooking is still one of my chief hobbies, and Indian cooking my favourite, requiring the bulk of the sixty or so spices that I maintain in our kitchen spice racks -- which does not include that western concoction known as curry powder (garam massala is something else).

d) As an economic historian, my interests have focused in particular upon money, prices, and wages in late-medieval Europe; and I thus have a considerable interest in living standards and consumption patterns, in both food and clothing, including of courses spices.

## **2. Spices in the Medieval and Early Modern European Economy:**

a) Furthermore, no economic historian of late-medieval Europe can ignore the importance of the spice trades and few can escape its fascinations. From the 12th to the 17th centuries, Oriental spices constituted the most profitable and dynamic element in European trade -- the veritable cream that brought Italian merchants in particular enormous profits; and it may very well be that Italian dominance of medieval commerce and finance rested principally upon their control of the Oriental spice trades.

b) Subsequently, the lure of enormous profits from the spice trades, along with a lust for gold and silver, were together the *leitmotif* -- the chief incentives for European overseas explorations and colonization from the late 15th to 17th centuries.

c) The Portuguese and the Spanish were the first to engage in this overseas race to bypass the Italians. Initially the Spanish seized control of gold and silver treasure in the New World; and the Portuguese of the very source of the Oriental spice trade in the East Indies and Malaysia, and India. [Vasco da Gama, 1497, on arriving in Calicut, India: 'I come in search of Christians and spices;' quickly forgot about the Christians.] Indeed it may be that the fundamental importance of New World treasure was to finance the veritable explosion in Europe's trade with Asia during the 16th, 17th, and 18th centuries: because Europe had very little to sell Asians except her silver in order to buy spices: European exports to Asia were roughly 75% silver and only 25% goods in the early modern era.

d) Economic power is more or less transitory and proved to be quite fleeting for the Spanish and Portuguese who were unable to monopolize these vast sources of new wealth. Indeed even before the mid-16th century the Arabs and Italians had broken the tenuous Portuguese spice monopoly to re-establish for Venice in particular an Indian Summer of golden commercial prosperity in the later 16th

century.

e) Instead it was the Dutch, whose new East India Company, established in 1600, rapidly succeeded in smashing Portuguese power in the Indian Ocean and then in displacing the Arabs and Italians to gain a virtually complete monopoly on the East Indies Spice Trade. The English East India Company, founded at the same time, was also forcibly expelled from the East Indies and had to settle for a distinct second best, namely India, then a much inferior source of spices. If India ultimately became more important -- when spices became less important, spices made the East Indies first best in the 17th century. In that century the Dutch gained decisive shipping, commercial, and financial hegemony in the European economy. Certainly the European economy had become far too complex for power to rest on just one area of trade; but undoubtedly the trade of the Dutch East India Company and its frequently enormous profits contributed no small share to that Dutch hegemony. And that hegemony first began to wane when the relative importance of spices declined within Europe -- though the link here is admittedly much more tenuous than the role of spices in the Dutch rise to power.

### **3. What Do We Mean by Spices? The Range and Costs of Oriental Spices**

a) The term 'spice' actually covers a host of things, including dyestuffs and a wide range of drugs and apothecary materials. But I am confining this discussion to the more traditional usage and on the screen I have indicated the names of the chief spices, with their Indian names.

b) Far and away the most important was pepper, which was always shipped as a large bulk commodity; followed by cinnamon, ginger, cloves. I have omitted two lesser spices used in medieval Europe but only rarely today: cubeb and galingale (the latter being close to ginger).

c) The accompanying maps on the screen show where these spices came from in Asia and the traditional overland and sea routes by which they reached western Europe. As was indicated in last week's lecture, the immense distances involved help explain why Oriental spices cost so much, were priced so high, in western European markets -- especially when spices had come part of the way by dangerous overland routes. Those spice prices might be 10 to a 100-fold higher than what Europeans had paid at the source in the East Indies. But the establishment of a direct sea route to Europe from 1500 meant an even greater distance, of over 6,000 miles, since that route had to go round the Cape of South Africa. Though sea transport is usually so much cheaper than land transport, especially when more of a direct route, that new route in fact did not lower prices.

d) Thus neither production nor pure transportation costs explain those prices: on the supply side we must also consider what economists now call transaction costs: all the exchange costs involved in getting goods from producers to consumers. These include information costs, market search and

negotiation costs, and above all protection (and insurance) costs. When you consider the large number of intermediaries involved in the long-distance spice trade, and all the assorted taxes and tolls levied on the spice trade from the East Indies to western Europe, you can appreciate how these costs would multiply. All these costs could fluctuate widely, with so many possibilities of trade disruptions, making the spice trade very risky indeed but obviously also potentially extremely profitable. All the more so, at the western end, when the Italians or Portuguese or, most effectively of all, the Dutch East India Company imposed a monopoly on the European sale of spices.

e) **How Expensive Were These Spices?** To say that they were costly is a commonplace, but how costly? What is our basis of comparison? On the screen I have tried to supply some estimates of the relative cost and values of Oriental spices and silks (another major element of that trade)

i) The first chart is one that Dr Ngai-Berthrong of the Royal Ontario Museum prepared, with some minor assistance from me, for the ROM's 1983 Exhibition on *Silk Roads, China Ships*: on the relative costs of those spices and silks expressed in terms of master mason's and carpenter's daily wage. How many days' wages would it take to buy a pound of each of these commodities (silk, pepper, cinnamon, ginger, tea), from the reign of Diocletian in the late Roman Empire to the late 19th century?

ii) Relative values are very hard to express: relative to what? We rejected the idea of expressing these prices in terms of grams of gold, because the purchasing power of gold has so radically changed over time, as indeed has its value in terms of just silver (9:1 in 1350; 16:1 in 1750; 65:1 today). Expressing values in terms of wheat equally ludicrous; but the labour of a skilled building craftsmen offers a measure of value with greater historical consistency and continuity -- has meaning.

iii) Semi-logarithmic scale is properly used in order to compare rates of change -- but also to squeeze in changes of such drastic magnitude. In Diocletian's day a pound of ginger cost 5,000 days wages (18.5 years, with 270 workdays per year); but in 1875, only 1.4 days' pay. The most dramatic change in relative values, on this chart, i.e. up to 1875, is between 300 and 1200, on eve of 4th Crusade, when Genoese and Venetians had consolidated their control over the Mediterranean spice trade. You will note, as I suggested earlier, that the direct sea route of the early-modern era made some but not a dramatic difference (pepper and ginger cheaper, cinnamon more expensive). The next dramatic change obviously occurred only in this present century. [Tea is added for comparison, but was only introduced, by the Dutch, in 1655.]

iv) The next table on the screen, from my own research in price history for 15th century London, shows how relatively expensive were spices, relative to both a day's wage and to prices for other foodstuffs. Again, I have related the cost of spices and of other foodstuffs to the daily wage of a master building craftsmen (mason, carpenter): showing how many days' wages to buy a pound; and conversely, how much (in ounces, gallons, etc.) could be purchased with a day's wage (8d. for London

masters; 6d. for those at Oxford or other towns).

v) In small towns, many foods would undoubtedly be cheaper, but certainly not spices (which would have to go through London first).

vi) I should stress here that this period is generally known as the Golden Age of the English Labourer: in terms of foodstuffs the purchasing power of 15th century labour was then higher than in either the preceding and succeeding centuries (before 19th).

vii) The final table shows you the dramatic change in prices and purchasing power that has occurred in this century: how much cheaper spices have become, so that it takes only about 15 minutes pay to buy a pound of pepper, ginger, or cinnamon. The only spice, and not an Oriental one, whose relative price has not really dropped, and the truly costly modern spice is saffron. It cost about \$1800 a pound (or \$4.00 a gram). When you realize that 225,000 stigmas of the saffron plant make up one pound, and consider the labour involved, you will understand why).

#### 4. The Demand for Spices in Late-Medieval Europe

a) In late-medieval and even early-modern Europe spices remained terribly expensive. But why? Surely questions of supply, high distribution costs, and monopoly tell only part and perhaps the less important half of the story. Not even the most rigorous monopolist can impose a high price that is not justified by a corresponding demand. What then was the demand for spices in late-medieval Europe (since I cannot cover all periods)?

b) Curiously enough, most economic history books do not really address this question of consumer demand. The authors either assume that the answer is self-evident -- and it is not -- or that it doesn't matter. Most economic historians are supply-oriented and more concerned with the role of spices in making that branch of medieval commerce and finance so very profitable, in explaining commercial expansion, economic leadership.

c) When I ask this question of my students, however, a very common answer to explain that demand is that spices, before the age of refrigeration, were required to preserve foods, meats especially. Spices, by that view, are a necessity (without substitutes). Indeed one most eminent historian who offers an explanation provides that very same reason: Kristoff Glamann, 'European Trade, 1500-1750,' in *Fontana Economic History of Europe, II: 16th and 17th Centuries* (1974), p. 447; and others certainly suggest this without being so categorical.

d) In my view, however, that reason is quite false. In so far as any spices had any preservative qualities, and really only cinnamon did, spices were not a necessity, because other, far cheaper commodities could preserve foods, meats, especially, far more effectively. Spices thus by definition

were not a necessity if such substitutes were available.

i) salt, instead, was the almost universal preservative for meat, fish, butter, etc.; and salt, for bodily requirements as well, was a necessity, which is why so many hard-hearted princes taxed salt so heavily.

ii) Pickling, as mixture of salt brine and vinegar, another form of food preservation for fish especially, and also meats

iii) Salting, smoking, and desiccation another form of preserving.

iv) Perhaps the crucial point is that European consumption of spices rapidly waned long before the coming of refrigeration.

e) Furthermore the concept of necessity, that spices were a necessary food preservative, is inconsistent with the equally common and more correct view that spices represented the cream of the luxury trades. A luxury good, especially whose high price made it generally available only to the rich, cannot be a necessity. The response to this challenge is that spices were a necessity for the rich but a luxury for the rest of society. Let us then consider variations on this theme, and see whether they also represent myths about the role of spices in medieval society.

**f) Were Spices a Necessity Only for Rich of Medieval Society?**

i) The necessity argument becomes qualified to mean a necessity only to preserve meat, and furthermore only for the rich who ate meat, while the poor lived on grains. For the 15th century, on which I wish to focus, this is most certainly false. I have already stressed that in north-west Europe at least this century was a Golden Age of generally high real wages, high real incomes for much of the lower strata, with very low rents and grain prices, when even the poor could afford to eat much meat. Indeed for central Germany, then probably less affluent than NW Europe, some historians estimate that per capita meat consumption was then about 100 kg. (220 lb.) annually -- much higher thus for adults; an annual per capita consumption that declined to just 20 kg. in 19th century.

ii) In England, a 15th-century account book for two parish priests and a servant show that 35% of their weekly outlays went on meat and fish vs. 20% for bread grains: certainly they followed the bible in not living by bread alone. And in Flanders our research also demonstrates a high and rising meat consumption amongst the lower strata of society in that era.

iii) Even in 16th century England, when living costs rose with growing population pressure, the Bury House of Correction (1588) provided a daily allowance of ½ lb. bread, 1 pint of beer, 1 pint of porridge, and 1/4 lb of meat; and far more substantial, of course, was the *daily* ration of a Tudor soldier with 2 lb. of beef or mutton (with 1 lb. cheese, 1/2 lb. butter, 1.5 lb. bread, 2/3 gallon of beer). Clearly the lower classes were highly carnivorous.

**g) An Alternative Theory: That Spices Were Required by the Rich to Disguise the Taste of Bad Meat or Highly Salted Meat?**

i) This argument assumes that the carnivorous lower classes had to put up with virtually inedible meat, but nevertheless ate a great deal of it. [One recalls the Woody Allen joke about the hotel in the Catskill that had never heard of *nouvelle cuisine*: ‘The food was quite disgusting -- but at least they gave you big portions’]

ii) But it is not true that spices were required to disguise the natural taste of bad meat: in particular, a large collection of late-medieval French and English recipe books and much other literary evidence on cuisine indicate that for those special feasts when spices were used liberally, both fish and fowl were cooked when perfectly fresh and the meats generally appear to be fresh (after being properly hung).

iii) But more to the point, these recipe books show that in these feasts with a multitude of dishes (in a dozen courses), highly spiced dishes were a minority: that most of the meat dishes in fact consisted of plain roasted, fried, broiled or indeed boiled flesh, with simple vegetables.

iv) Furthermore, many of the spices used were for the sauces that were served with the meats; and the French manual *Le Ménagier de Paris* (1393) advised cooks to ‘put in the spices as late as possible.’ If the aim had been to disguise the taste of the flesh (as I might do with very cheap meat in my own Indian cooking), the spices would be added in the beginning, with the meat allowed to simmer in the spices for a long time.

v) As for highly salted meat: boiling or parboiling can eliminate much of the salty taste; and much meat was indeed eaten in boiled or stewed form.

vi) Indeed, Constance Hieatt and Sharon Butler in their book *Pleyn Delit: Medieval Cookery for Modern Cooks* emphatically state: ‘Much medieval cooking [for rich and poor alike] was so bland as to seem dull today.’

vii) Spices were in short a luxury and treated as such even by the very rich in late-medieval society.

#### **h) Why Were Spices Used and So Highly Valued?**

i) First, for the same reason that I vastly prefer Indian or almost any other Oriental or Middle Eastern cooking to dull, bland, modern English cooking, even when the meats or fowl are perfectly fresh and of good quality: because foods so cooked with spices taste so much better or so much more exciting; that it can make eating one of life's great delights; that it makes eating these meals such a highly prized luxury, to break the routine of bland meals. But this, so to speak, is a matter of taste, an acquired taste for spices that not everyone does acquire.

ii) A matter of both social fashion and social prestige -- a sign of wealth, high social status, and conspicuous consumption.

iii) Also the belief that spices and spiced foods served valuable medicinal functions: as shown on the screen, various spices were reputed to serve as digestive, stimulants, cures for halitosis, fevers,

headaches, colic; and as ‘carminatives,’ i.e. cure for flatulence. But in my experience, some spices were more likely to cause it than cure it.

## 5. How Were Spices Used in Medieval English and French Cuisine?

a) To gain some perspective on their use in medieval cuisine, let us quickly see how they are used today in modern Indian cooking. On the screen I present a few of my favourite Indian recipes, for

- Roghan Josh and Murgh Korma (lamb, beef, chicken dishes)
- Morgee Masalah, Moorgee Kurma; Moorgee Badam, Moorgee Tanjore (chicken)
- Shahi Kofta and Kuwab Mutter Masalah: meatballs with spiced sauces

b) **Note the following in these Indian recipes:**

i) the use of the leading spices, medieval and modern: pepper, cinnamon, ginger, cloves, cardamom, saffron, coriander, cumin, turmeric

ii) some spices were usually or frequently employed at the beginning of the cooking process, with a base of onions, yoghurt, coconut milk, or tomato sauce; others added during the cooking (with coconut milk, tomato); and some were added near the end, to retain their aroma

iii) note also the use of various nuts, especially almonds, currants or raisins, and vinegar

iv) Some of these modern recipes call for spices that were unknown to the medieval world: in particular chili peppers of the capsicum family (red peppers, cayenne, paprika, chili), which Europeans found in the Americas, imported into Europe, and then transported to India.

v) Tomatoes, now widely used in curries, were similarly an American vegetable transported to India in early modern period.

c) Next, on the screen, for direct comparison, I present a series of late-medieval English recipes, taken from the previously mentioned collection **Pleyn Delit: Medieval Cookery for Modern Cooks**, by Hieatt and Butler. They are quite unlike modern English recipes, and surprisingly similar, in many respects, to the Indian recipes just shown

d) Recipes on the screen, as examples:

i) *Pommeaulx* (medieval English) and *Shahi Kofta* (Indian): for comparison, both of these are ground meatball dishes

ii) *Egurdouce*: Sweet and Sour Rabbit (from French ‘aigre’ and ‘douce’)

iii) *Civey of Coney*: Rabbit stewed with onions (coney, coneyne = rabbit)

iv) *Steykes of Venson or Beef; Bourbelier de Sanglier* (Loin of Wild Boar in Boar's Tail Sauce); and *Roast Lamb with Cameline Sauce*.

v) *Cawdel of Samon* (Salmon and Leeks in Almond Sauce); *Galantine of Pike*

vi) *Roast Capon with Black Sauce*

**e) Note the following:**

i) Similarity in use of spices with those Indian dishes: again the use of pepper, ginger, cinnamon, cloves, saffron, cardamom, mace. More than half of all medieval English and French recipes call for saffron, the most costly of all medieval and modern spices (or herbs).

ii) Note again similar use of almonds, raisins (currants) and vinegar or wine; here used as a substitute for medieval *verjuice*, which was a form of wine vinegar or soured lemon juice.

iii) Note that many of these recipes called for meat or fowl that was simply roasted without spices, with highly spiced sauces added to the dish, sauces also containing combination of eggs, ground almonds, rice flour, and bread crumbs.

iv) Finally note how often French names were given to English dishes (since most of the aristocracy spoke a French dialect: Anglo-Norman)

**f) Who Would Consume Such Dishes?**

i) Hiatt and Butler believe that the aristocracy, the landed gentry, and probably some of the upper strata of the bourgeoisie, i.e. urban lawyers and professionals, merchants, etc. would frequently have at least one dish of this type during their main meal, which was usually the noon meal; and more such dishes of course during seasonal feasts

ii) Town artisans and labourers, small farmers and peasants, of course, would rarely if ever consume such dishes: and their main meal usually consisted of some bacon, salted beef or pork, herrings, cheese, eggs, perhaps some vegetables like peas and beans (no potatoes, of course), bread, and milk or ale. (Some evidently used local, west European herbs in cooking: such as thyme, marjoram, bay leaves, savory, garlic). That meant vast majority of population.

iii) Town craftsmen, however, almost certainly consumed such highly spiced dishes during those special, seasonal feasts, especially in their guildhalls.

**g) Food and Spice Requirements for 15th Century Guildhall Feasts**

As examples of these, I next show on the screen shopping lists for two fifteenth-century London guildhall feasts: the first for the London Brewers' Guild Feast of 1422, and the second for the London Grocers' Feast of 1470: which I've taken from account books in the London Guildhall Manuscript Library. Note the following:

i) note again the similarity in the spices most called for: pepper, ginger, cinnamon, cloves, mace, saffron, and anise, matching those in the late-medieval English and modern Indian recipes.

ii) Note the other cooking condiments called for in cooking dishes with spices: sugar, honey, mustard, vinegar, almonds, raisins, rice flour, *vergeon* or verjuice, again matching the recipes.

iii) Note again how expensive these spices were in relation to a craftsman's daily wage, from 6d. to 8d.

- iv) Note the wide variety of meats, fowl, and fish: some were not too expensive, perhaps, but many were -- especially the swans and pike, cod, sturgeon. In 1421-23, a London craftsman's daily wage would just buy a goose, and only 1 1/1 pork loin roast, but three rabbits.
- v) Note finally the very large quantities of beer and wine consumed -- and how very cheap the beer or ale was.

## 6. The Relative Decline in Spice Consumption after 1650

- a) If these late-medieval English recipes and shopping lists for guild feasts seem so strangely out of place to you, so would they to a later 17th and 18th century Englishman. Seventeenth-century recipe books show much simpler cooking without so many spices (Francois de la Varenne, 1651); and one famous 17th century satire (Boileau: 1665) ridicules the excessive use of spices in cooking.
- b) We also know from the composition of ship cargoes, by both the Dutch and English East India Companies, that spices swiftly declined in relative importance after the 1660s (and the Dutch are subsequently reported to have burnt or dumped cargoes of pepper or nutmeg to maintain high prices).
- c) Note again that this decline in spice consumption came long before refrigeration, though it may possibly be tied to advances in agriculture
- d) Has been conjectured (Glamman, Braudel) that it is linked to a relative decline in meat consumption: but I do not believe this.
  - i) If meat consumption declined, it did not decline to the levels of the 13th and 14th centuries when spice consumption was indisputably high.
  - ii) Overlooks the fact that spices were widely used in cooking of wide variety of non-meat dishes: soups, vegetables, pies, cakes, jams and jellies, drinks, etc. (in which, of course, spices still used).
- e) Changes in fashions, changes in taste?

## MEDIEVAL SPICES

and their reputed or deemed medicinal properties:

SPICE	PROPERTIES
PEPPER	The most widely used spice, then and now, but not for any significant medical values
GINGER	Next most widely used spice: a digestive, carminative (to counteract flatulence), stimulant; to counteract anaemia and liver complaints; to ward off colds.
CINNAMON	Third most important spice: also as a stimulant, carminative, astringent; some reputed qualities as a food preservative.
CLOVES	Digestive, stimulant, local anaesthetic (e.g., toothaches)
CARDAMOM	Digestive; to counteract halitosis (bad breath), headaches, fevers, colds
CUMIN	Digestive
ANISE	Digestive
NUTMEG & MACE	Digestive, carminative, stimulant; cure for colic
SAFFRON	The world's most expensive herb or spice, then and now. A stimulant; cure for headaches, heart palpitations, fainting fits, dropsy, gastric ulcers

## Spices in Medieval European and Modern Indian Cuisine

### MOORGEE KURMA: Chicken Curry, with Poppy Seeds (Modern Indian)

1 broiler chicken, cut up: 2.5 to 3.5 lb	8 cloves, crushed
1 cup plain yoghurt	1 tsp ground cinnamon
4 medium onions, finely sliced	1 tsp ground ginger
5 tablespoons vegetable shortening, or oil	1 tsp crushed garlic
2 cups hot water	1 tsp red pepper flakes
salt to taste	½ tsp ground ginger
	1 tablespoon coriander, ground
	½ coconut, ground
	1 tablespoon poppy seeds
	1 lime: juiced
	24 cashew nuts

1. Brown onions in large skillet or wok and add separately: cloves, cinnamon, ginger (1 tsp), garlic, yoghurt; mix thoroughly, and then add the chicken; and stir fry for 5 minutes at medium heat.
2. In a small skillet, heat vegetable oil/shortening; and add red pepper flakes, ½ tsp. ginger, and coriander; stir-fry to 3 minutes, and then add to the chicken mixture; add water, and cover tightly, and simmer slowly, for one hour.
3. Grind the coconut and poppy seeds together (with a cuisinart or blender) and add the coconut paste to the chicken about 20 minutes before the end; with the heat off, add the cashew nuts and lime juice.

### SHAHI KOFTA: Indian Meatballs (Modern)

1 medium onion, quartered	1 one-inch piece of ginger root (2 tsp ground)
1 lb. lamb or beef, ground (minced)	6 black peppercorns
1 egg, well beaten	½ tsp. cinnamon, ground
1 large onion, finely sliced	½ tsp. coriander seeds
4 tablespoons vegetable oil or shortening	1 tablespoon ground coriander
½ cup of boiling water	1 tsp turmeric, ground
1 green or red bell pepper, finely chopped	1 tablespoon cumin seeds
	1 tsp. cayenne red pepper or chili powder
	½ tsp. ground mace
	½ tsp. ground cardamom

1. Place quartered onion, ginger, peppercorns, cinnamon, coriander seeds in a cuisinart or food blender; and grind to a fine paste.
2. In a mixing bowl, place ground meat (beef or lamb), egg, ground onions, and the spice paste mixture and mix well; form into small marble-sized meatballs.
3. In a large skillet or wok, quickly fry (sauté) the meatballs and light brown; remove from heat.
4. In the same skillet, add sliced onion and brown; then add coriander, turmeric, cumin seeds, red pepper or chili powder, mace, and cardamom. Stir-fry for a few minutes; add the ½ cup water

and meatballs, cooking slowly until the gravy is thick.

5. Serve with steamed or fried rice (which can be mixed with frozen peas and mushrooms).

**POMMEAULX: late 14th - early 15th century French and English**

2 lb. ground meat: beef, lamb, pork, veal or a combination thereof	½ tsp. ginger, ground
2 eggs, well beaten	½ tsp. ground mace
parsley	½ tsp. ground cardamom
rice flour	6 cloves; or ½ tsp. ground cloves
	chopped currants to taste
	almonds, ground

1. In place of eggs, substitute a mixture of ground almonds, water or beef bouillon, rice flour; with ½ cup boiling water per tablespoon of ground almonds and 1 tablespoon of rice flour. Or, this mixture may also be used with the beaten eggs, but preferably one egg only.
2. In a mixing bowl, mix the ground meat with the eggs, rice flour, spices, chopped currants, and ground almonds; quickly stir-fry in a large skillet or wok; turn down the heat and simmer; add sprinkled parsley when serving.

**CAPOUN Y-ROSTYDE WITH BLACKKE SAWSE: Roast Capon with Black Sauce (English)**

1 capon (or broiling chicken), about 6 lb.	1/4 tsp. ground anise
1 capon liver, cooked and well ground	½ tsp. ground ginger
1/4 cup of bread crumbs	½/ tsp. ground cardamom
wine vinegar or lemon juice	½ tsp. ground cinnamon

Roast the capon and make a sauce with the ingredients listed above, mixed with the capon drippings and sufficient water to make a gravy.

**PIKE IN GALENTYNE: Galantine of Pike (Late medieval French)**

Pike or pickerel: 1 whole, about 2 - 3 lb.	½ tsp. ground cinnamon
1 large onion, chopped	½ tsp. ground ginger
2 slices of whole wheat bread	1/4 tsp. ground black pepper
1.5 cups of white wine	1/4 tsp. galingale
1 tablespoon of white-wine vinegar	1/4 tsp. ground cloves
2 sprigs of parsley	

**BOURBELIER DE SANGLIER: Loin of Wild Boar in Boar's Tail Sauce (late-medieval French)**

Pork Loin Roast, 4 - 6 lb. (or wild boar)  
2 tablespoons of bread crumbs  
salt to taste  
½ cup hot water  
½ cup red wine  
1/4 cup wine vinegar

16 cloves: or enough to stud the roast  
½ tsp. ground ginger  
½ tsp. ground cardamom  
½ tsp. ground black pepper (peppercorns)  
½ tsp. ground cinnamon  
1/4 tsp. ground cloves  
1/4 tsp. ground nutmeg

Roast the park, with cloves studded in the pork loin; then make a sauce with the roast drippings, the above ingredients, and ½ cup of boiling water.

**MOUTON Y-ROSTED WITH SAWSE CAMELYNE: Roast Lamb with Cameline Sauce (15th century English)**

Leg of lamb, about 2 - 3 lb.  
2 tablespoons of breadcrumbs  
1/4 cup of red currants  
½ cup of red wine vinegar

½ tsp. ground ginger  
½ tsp. of ground cinnamon  
1/4 tsp. of ground cloves  
1/4 cup of nuts: walnuts and/or almonds

Roast the lamb; then make a sauce with the roast drippings, the above ingredients, and ½ cup of boiling water, if needed for the gravy.

**THE COMMODITY PURCHASING POWER OF WAGES IN 15TH CENTURY LONDON**

<b>PURCHASING POWER OF A LONDON CRAFTSMAN'S DAILY WAGE in 1438 - 1439: for Textiles, Foodstuffs, and Spices</b>						
<b>In terms of a master mason's or master carpenter's daily wage of 8d.</b>						
<b>COMMODITY</b>	<b>Price per</b>	<b>Unit</b>	<b>Quantity Purchased</b>	<b>Quantity Purchased</b>	<b>No. of Days'</b>	<b>No. of Days' Wages</b>
	<b>Unit</b>		<b>by Daily</b>	<b>by Weekly</b>	<b>Wages to</b>	<b>at 6d per day</b>
	<b>in d.</b>		<b>Wage of 8d</b>	<b>Wage of 48d</b>	<b>Buy 7 yds</b>	<b>for Oxford Cambridge mason</b>
<b>TEXTILES</b>						
<b>Canvas</b>	2.000	yard	4.000	24.000	1.75	2.33
<b>Brabant Linen</b>	6.400	yard	1.250	7.500	5.60	7.47
<b>Flemish Linen</b>	12.100	yard	0.661	3.967	10.59	14.12
<b>English Worsted</b>	3.500	yard	2.286	13.714	3.06	4.08
<b>English Kersey, Dyed</b>	17.900	yard	0.447	2.682	15.66	20.88
<b>English Broadcloth, Dyed: average</b>	25.400	yard	0.315	1.890	22.23	29.63
<b>English Broadcloth, Dyed: highest</b>	40.000	yard	0.200	1.200	35.00	46.67
<b>Scarlet Broadcloth: average</b>	144.200	yard	0.055	0.333	126.18	168.23
<b>Scarlet Broadcloth: highest range</b>	228.000	yard	0.035	0.211	199.50	266.00
<b>Flemish Broadcloth (Ghent Dickedinnen)</b>	65.158	yard	0.123	0.737	57.01	76.02
<b>Silk: Velvet: average</b>	181.080	yard	0.044	0.265	158.45	211.26
<b>Silk: Velvet: highest range</b>	279.960	yard	0.029	0.171	244.97	326.62
<b>Silk: Damask</b>	144.000	yard	0.056	0.333	126.00	168.00
<b>Silk: Plain Satin</b>	105.000	yard	0.076	0.457	91.88	122.50
					<b>to Buy Unit</b>	<b>6d per day to buy</b>

**PURCHASING POWER OF A LONDON CRAFTSMAN'S DAILY WAGE in 1438 - 1439: for Textiles, Foodstuffs, and Spices**

<b>In terms of a master mason's or master carpenter's daily wage of 8d.</b>						
<b>COMMODITY</b>	<b>Price per Unit</b>	<b>Unit</b>	<b>Quantity Purchased by Daily Wage of 8d</b>	<b>Quantity Purchased by Weekly Wage of 48d</b>	<b>No. of Days' Wages to Buy 7 yds</b>	<b>No. of Days' Wages at 6d per day for Oxford Cambridge mason the Unit</b>
<b>OTHER COMMODITIES: Food and Fuel</b>						
Almonds	3.000	pound	2.667	16.000	0.38	0.50
Honey	2.500	pints	3.200	19.200	0.31	0.42
Milk	1.000	gallons	8.000	48.000	0.13	0.17
Butter	1.000	pints	8.000	48.000	0.13	0.17
Salt	0.500	pints	16.000	96.000	0.06	0.08
Eggs	0.157	number	51.000	306.000	0.02	0.03
Apples	0.080	number	100.000	600.000	0.01	0.01
Rye Flour	4.000	pound	2.000	12.000	0.50	0.67
Chickens	5.000	number	1.600	9.600	0.63	0.83
Capons	1.509	number	5.300	31.800	0.19	0.25
Rabbits	4.000	number	2.000	12.000	0.50	0.67
Sole (Fish)	2.182	number	3.667	22.000	0.27	0.36
Red Wine	5.000	gallons	1.600	9.600	0.63	0.83
Penny Ale (Beer)	0.748	gallons	10.700	64.200	0.09	0.12
Good-Quality Ale	1.778	gallons	4.500	27.000	0.22	0.30
Tallow Candles	1.333	number	6.000	36.000	0.17	0.22
Coal	0.748	bushels	10.700	64.200	0.09	0.12

**PURCHASING POWER OF A LONDON CRAFTSMAN'S DAILY WAGE in 1438 - 1439: for Textiles, Foodstuffs, and Spices**

<b>In terms of a master mason's or master carpenter's daily wage of 8d.</b>						
<b>COMMODITY</b>	<b>Price per Unit</b>	<b>Unit</b>	<b>Quantity Purchased by Daily Wage of 8d</b>	<b>Quantity Purchased by Weekly Wage of 48d</b>	<b>No. of Days' Wages to Buy 7 yds</b>	<b>No. of Days' Wages at 6d per day for Oxford Cambridge mason</b>
<b>SPICES</b>						
<b>Pepper</b>	18.028	pound	0.444	2.663	2.25	3.00
<b>Ginger</b>	12.000	pound	0.667	4.000	1.50	2.00
<b>Cinnamon</b>	24.151	pound	0.331	1.988	3.02	4.03
<b>Cloves</b>	35.556	pound	0.225	1.350	4.44	5.93
<b>Saffron</b>	182.857	pound	0.044	0.263	22.86	30.48
<b>Sugar</b>	16.000	pound	0.500	3.000	2.00	2.67

**Prices of Spices in Antwerp, London, and Oxford in 1438-39  
in pence groot Brabant and English pence sterling, compared to prices in Toronto  
in 2003-04 (in Canadian dollars) per lb. avoirdupois and kilogram  
and the quantities that could be purchased by a master carpenter's daily wage**

<b>Name of the Spice</b>	<b>Antwerp d. gr. per lb.</b>	<b>Antwerp d. gr. per kg.</b>	<b>Oxford d. ster. per lb.</b>	<b>Oxford d. ster. per kg</b>	<b>London d. ster. per lb.</b>	<b>London d. ster. per kg.</b>	<b>[2003] Toronto \$CAD per kg</b>	<b>[2003] Toronto \$ CAD per lb</b>
<b>Cloves</b>	74.63	153.14	48.00	105.82	35.56	78.39	63.38	28.750
<b>Cinnamon</b>	22.54	46.26	20.00	44.09	24.15	53.24	19.89	9.020
<b>Ginger</b>	15.55	31.90	28.00	61.73	12.00	26.46	16.91	7.670
<b>Mace</b>			36.00	79.37			80.00	36.290
<b>Pepper</b>	20.21	41.48	12.75	28.11	18.03	39.74	30.00	13.610
<b>Saffron</b>	373.15	765.70	176.00	388.01	182.86	403.13	3,750.00	1,700.970
<b>Sugar</b>	12.44	25.52	24.00	52.91	16.00	35.27	4.40	2.000
<b>Brown Sugar</b>							2.45	1.110

	<b>Antwerp Daily Wage in d groot</b>	<b>Antwerp Daily Wage in d groot</b>	<b>Oxford Daily Wage in d ster.</b>	<b>Oxford Daily Wage in d ster.</b>	<b>London Daily Wage in d ster.</b>	<b>London Daily Wage in d ster.</b>	<b>Toronto Daily Wage in \$CAD</b>	<b>Toronto Daily Wage in \$CAD*</b>
	10.00	10.00	6.00	6.00	8.00	8.00	236.88	236.88

<b>Name of the Spice</b>	<b>lb. bought with daily wage</b>	<b>grams bought with daily wage</b>	<b>lb. bought with daily wage</b>	<b>grams bought with daily wage</b>	<b>lb. bought with daily wage</b>	<b>grams bought with daily wage</b>	<b>grams bought with daily wage</b>	<b>lb. bought with daily wage</b>
<b>Cloves</b>	0.13	65.30	0.13	56.70	0.22	102.06	3,737.46	8.240
<b>Cinnamon</b>	0.44	216.17	0.30	136.08	0.33	150.25	11,909.50	26.256
<b>Ginger</b>	0.64	313.44	0.21	97.20	0.67	302.39	14,008.28	30.883
<b>Mace</b>			0.17	75.60			4,955.65	10.925
<b>Pepper</b>	0.49	241.11	0.47	213.46	0.44	201.28	7,896.00	17.408

<b>Saffron</b>	0.03	13.06	0.03	15.46	0.04	19.84	63.17	0.139
<b>Sugar</b>	0.80	391.80	0.25	113.40	0.50	226.80	53,836.36	118.689
<b>Brown Sugar</b>							96,685.71	213.156

<b>Name of the Spice</b>	<b>No. of Days' Wages to Buy 1 lb.</b>	<b>No. of Days' Wages to Buy 100 g.</b>	<b>No. of Days' Wages to Buy 1 lb.</b>	<b>No. of Days' Wages to Buy 100 g.</b>	<b>No. of Days' Wages to Buy 1 lb.</b>	<b>No. of Days' Wages to Buy 100 g.</b>	<b>No. of Minutes at \$29.61/hr To Buy 100 g</b>	<b>No. of Minutes at \$29.61/hr To Buy 1 lb.</b>
<b>Cloves</b>	7.46	1.53	8.00	1.76	4.44	0.98	12.84	58.25
<b>Cinnamon</b>	2.25	0.46	3.33	0.73	3.02	0.67	4.03	18.28
<b>Ginger</b>	1.55	0.32	4.67	1.03	1.50	0.33	3.43	15.54
<b>Mace</b>			6.00	1.32			16.21	73.53
<b>Pepper</b>	2.02	0.41	2.13	0.47	2.25	0.50	6.08	27.57
<b>Saffron</b>	37.31	7.66	29.33	6.47	22.86	5.04	759.88	3,446.75
<b>Sugar</b>	1.24	0.26	4.00	0.88	2.00	0.44	0.89	4.04
<b>Brown Sugar</b>							0.50	2.25

**Notes:**

\* As noted above, saffron has always been the world's most expensive spice or herb. In the past decade, it has, in fact, fallen in price: for in 1993, it was priced at \$4.00 CAD a gram (in Toronto); and is now (2001) \$3.75 a gram. When saffron is called for in late-medieval English and French recipes, or in modern Asian recipes, I use instead the much cheaper but similarly-coloured turmeric. Turmeric currently sells, in Toronto, for \$8.85 CAD per pound or \$19.52 per kilogram.

\*\* In Toronto a master carpenter currently (as of May 2003) earns \$29.61 per hour and thus \$236.88 for an eight-hour day (The Ontario average hourly wage is \$28.48). In fifteenth-century Antwerp, London, and Oxford, a master carpenter (and mason, etc.) worked at least twelve, and up to fourteen, hours a day during the Spring, Summer, and Fall months; in the winter months (early December to March), they usually worked only eight hours, according to the available sunlight. Thus the medieval artisans literally 'worked from sun to sun'.

In Antwerp, 1d groot Brabant = 0.667d groot Flemish; 1d groot Flemish = 1.5d groot Brabant

The Antwerp lb. = 470.156 grams; and it was converted into lb. avoirdupois and kilograms

**Sources:**

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Toronto Carpenters' Wages: Carpenters Union, the District Council of Ontario (whose assistance is gratefully acknowledged).