RURAL INDUSTRIES RESEARCH
& DEVELOPMENT CORPORATION

Culinary herbs:
a market assessment

A report for the Rural Industries Research and Development Corporation

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Foreword

The Australian culinary herb industry has been very traditional. What was grown, where it was grown, what were the standards, and what were the outlets were factors largely determined by tradition.

Significant changes have occurred in the industry over the past few decades. The biggest changes have been in the outlet side. There have been enormous changes in what is being eaten, where it is being eaten, and the form of how it is being eaten. For the production side of the culinary herb industry this has meant significant changes, especially in the standard and form of the product being presented to the buyers.

This project examines the criteria upon which the buyers base their decisions.

In developing these criteria, the RIRDC seeks to enhance the competitiveness of the Australian culinary herb industry. As the project reveals, virtually the total volume of culinary herbs consumed in Australia in the dry form are imported.

This project was funded from RIRDC Core Funds which are provided by the Federal Government.

This report, a new addition to RIRDC's diverse range of over 700 research publications, forms part of our (New Plant Products R&D program, which aims to (enhance the competitiveness of Australia's herbs and spices industry. .

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- downloads at www.rirdc.gov.au/reports/Index.htm
- purchases at www.rirdc.gov.au/eshop

Peter Core
Managing Director
Rural Industries Research and Development Corporation

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Executive Summary

The Australian culinary herb industry has been very traditional. What was grown, where it was grown, what were the standards the herbs were grown to, and what were the outlets where the herbs went were factors largely determined by tradition.

Significant changes have occurred in the industry over the past few decades. The biggest changes have been in the outlet side where the changes relate to what is being eaten, where it is being eaten, and the form of how it is being eaten. For the production side of the culinary herb industry this has meant significant changes, especially in the standard and form of the product being presented to the buyers.

The market has now six basic end-consumers: the traditional home buyer, restaurants, caterers, manufacturers, processors, and re-packers. Whilst culinary herbs in the form of fresh bunches still go to the first three outlets, product in fresh bulk, frozen and dried forms go to the latter three as well as to caterers.

This project examines the criteria upon which the buyers base their decisions.

These criteria related to price, quality in terms of physical appearance, chemical composition in terms of volatile oils and residues, and microbiological issues in terms of Total Plate Count.

There were a number of over-arching conclusions. First, all buyers placed price close to but not necessarily at the top of their hierarchy of requirements when buying herbs. They stated that price is always relative to quality and what the market will bear. Second, there is no such thing as "best quality". Instead, quality is something that best meets each buyer/user's standards of physical, chemical, microbiological, and organoleptic attributes. Third, bearing the above two points in mind, buyers did not have an automatic preference for imported product. This augers well for the Australian industry.

Buyer comments clearly point to a number of areas that Australian culinary herb producers should look at in order to advance their industry.

One is the Bulk Index. This is the ration between volume and weight. Given that the re-packer industry is based on packing a variable volume into a fixed package size, Bulk Index is critical to profit. Growers need to be aware of the principles behind the Bulk Index, the general Bulk Index for their herbs, and the preferred Bulk Index employed by their buyers.

Another issue is the microbiological standard of Total Plate Count. Because herbs and spices are used as ingredients across a diverse range of foods that are handled and stored in a wide variety of conditions, a high Total Plate Count may have a significant impact on either the shelf life of the product or in a worst case scenario, cause food poisoning. Given the increasing trend of food marketers moving towards HACCP systems of food standards, failure to be aware of microbiological factors could revibrate against Australian culinary herb producers. It was pointed out that buyers are aware that domestically grown herbs are not treated to the same degree of rigorous health standards as the imported product. Again, this could change under the imperatives of non-discriminatory practices imposed by the World Trade Organisation.

In the same broad area of health and safety is the awareness by Australian buyers that although Australia has a "clean and green" image, heavy metal residues are a cause for concern with

Australian grown material, a by product of our environment coupled with the effects of high super phosphate use for many years.

Dealing in non- GMO products is definitely seen as being an advantage.

Finally buyers expressed concern regarding market structure. In the main, the Australian culinary herb industry has a poor reputation for being able to supply lines of consistent quality and volume. Many importers have some form of exclusivity with an exporter, precluding competitors from gaining access to the same material at similar pricing. These importers may also deal with a number of exporters, so should there be a crop failure or other supply issue, the importer can get a similar grade from another supplier and still keep customers satisfied. A perceived downside to dealing with the Australian producing industry is that they will sell their material to all comers, so it is not worth putting in the time and effort to convince a customer to try local material. There is also a history of local growers by-passing the importer/distributor and selling direct to the importer's customer. This may appear to cut out a middle-man. However, should the grower not be able to sustain continuity of supply the buyer then has to evaluate imported material again and will probably not be prepared to go through the hassle of changing suppliers again. In these circumstances the buyer tends to go back to the importer for supplies that will be available on a consistent basis. It is for these reasons that the paper concludes with the recommendation for cooperating action between growers.

1. Introduction

Australia's culinary herb industry is of long standing. As with most long standing industries, tradition dictated what was grown, where was it grown, and in what form was it consumed. What typified the industry was the direct contact between growers and clients in largely the retail / household sector.

The Australian market for culinary herbs falls into two major categories:

- Fresh.
- Dried.

Frozen herbs and essential oils of herbs are also used in some sectors of the food manufacturing industry, an important element that also is worthy of consideration.

Since the initial establishment of an ideal culinary herb industry, there has been significant developments in the supply chain, increased sophistication of the end consumer, and a marked growth in market segmentation. There has been the rapid growth of the ready-to-eat meal sector where herbs play a major role in assisting non-price product discrimination, and the catering sector with the supply of pre-prepared products expanding strongly.

The current forms, channels, and end-user segments of the industry are summarised below:

Form	Channel	End User
(a) Fresh bunches	Supermarkets/F&V Shops Fruit and Vegetable Wholesalers	Consumers Restaurants Caterers
(b) Fresh bulk	Direct to end user	Manufacturers Processors
(c) Frozen	Direct to end user	Caterers Manufacturers Processors
(d) Dried	Importers/Distributors	Manufacturers Re-Packers

A broad-brush view of the dynamics of the culinary herb market is that 99 percent of buyers do not care what country of origin a herb comes from. Due to existing market conditions, infrastructure and distribution it may also be generalised that 99 percent of fresh herbs used are grown in Australia and that 99 percent of dried herbs are imported.

2. Objectives

Given the increasing length of the marketing chain, herb growers are being removed from the immediacy of feedback from the final consumer. With the development of the food processing sector and the food service sector, it is possible that growers are up to date with those developments. Given that most culinary herb growers have very small scale operations, their ability to be aware of the criteria of upon which the new buyers base their decisions are quite hard for them to establish.

The project seeks to establish those criteria.

It is considered that if growers are aware of those criteria, then they are aware of areas that they should look at in order to advance their industry.

3. Methodology

To understand the criteria upon which the culinary herb industry's "buyers" purchased, a survey was made of those buyers that have some tangible influence on where herb supplies are purchased. There are four key groups ranked from 1 to 4 in order of their importance to the industry.

(i) **Importers and Distributors**: These businesses trade only in bulk, either by the gunny sack or in some circumstances re-packed into bulk packs in excess of 1 kilo (on average).

(ii) **Food Service Suppliers**: These sell to restaurants and caterers and include agents in the fresh markets in the key capital cities of Sydney, Melbourne and Brisbane.

(iii) **Food Processors**: Manufacture products that are on-sold to restaurants, caterers and supermarkets. This group may include a manufacturer of fresh salads, a manufacturer of preserved herbs in jars or tubes, or a dry pack producer of instant meals.

(iv) Caterers, restaurants and retailers have almost no influence on the country of origin of herbs they buy, however some quality criteria may indicate opportunities for Australian grown material that is not being presently met by the existing sources.

The survey objective was to identify the key criteria culinary herb buyers are looking for and determine the relative influencing factors of those criteria. For example it makes no difference to a supermarket what country a retail pack of basil comes from and provided the dried basil they buy from an importer meets their quality criteria, that retail brand (or any other re-packer) will not necessarily be concerned about the herb's country of origin.

Therefore for each product form, only buyers or key buyer influencers were targeted for interviews.

3.1 Interviews

Industry leaders were interviewed on the basis that their identities would remain confidential. Volume data and costs have been consolidated where appropriate so that no individual buyer's data is disclosed. It should be noted here that everyone interviewed was most co-operative and although

some industry comments may appear negative or cruelly realistic, there was an overall sympathy towards the proposition of developing a dynamic herb growing industry in Australia.

During the interviews, the following criteria were used with respect to each of the 15 herbs to be surveyed.

3.2 Herbs Purchased

Surveyed the buyer/user for each item listed and identified existing purchasing behaviour with particular reference to:

- *Form:* Whether the product falls into (a), (b), (c), or (d) above (more than one form may be purchased by a particular user).

- *Qty P/Yr:* The volume in Kilos bought per year.

- *C/Origin:* The country of origin of this material (if known).

- *Comments:* Any brief comment that relates specifically to that commodity.

3.3 Perception of Australian Material

Buyers were surveyed for the key criteria and quality attributes that influence their purchasing decisions. Seven criteria were identified:

3.3.1 Price

Where does pricing fit in the hierarchy of criteria.

3.3.2 Quality

Although quality is often defined as a subjective factor, there are four important criteria that the majority of buyers/users will take into account:

- Physical.
- Chemical.
- Microbiological.
- Organoleptic attributes.

It should be stressed at this point (and will be referred to again later) that there is almost no such thing as “best quality” as a generalisation. The best quality material is that material which most closely meets the buyer/user’s four key criteria.

3.3.3 Physical

The physical attributes of material are the *colour*, *appearance* and *bulk index.* These physical attributes are always assessed on the basis of existing standards and variations would be regarded in most instances as undesirable.

- *Colour* is determined by a visual check and in some cases may be quantified with scientific instrument readings or industry standard terms of measurement.

- *Appearance* is assessed by the experienced buyer/user who will look for extraneous matter, evidence of insect activity, dust and any other element that may effect the look of the material. Quantifiable tests can also be conducted such as the "ash" tests that determine the amount of dirt which is contaminating a sample.

- *Bulk index* is the weight to volume relationship best explained by the old riddle, "what weighs the most, a ton of sand or a ton of feathers"? Naturally they both weigh the same – a ton. However they would each occupy greatly differing volumes.

  The same principle applies to herbs and spices. Thus while a measure of ground coriander seed may weigh ten grams, the exact same measure of ground cloves may weigh twenty grams because its density is greater. That is why when one buys herbs and spices, the pack sizes may look all the same but the weights can vary from a few grams to a hundred grams. These variables are compounded when some of the spices being used may be whole, chopped, sliced or ground. *Bulk index* is especially critical for re-packers of herbs and spices who have a fixed size container to pack. If one batch of herbs weighs too light then it will not meet the declared weight and if another batch weighs heavier, then in order to fill the container the re-packer may have to 'give away'10 to 20 percent of product, thus reducing the profit margin.

  The *Bulk Index* of a product is usually quoted in grams per 250 mLs. One can then divide the volume by the weight to arrive at a *Bulk Index* figure.

  For example, consider the following four commodities:

Commodity		**Weight Volume**	**Bulk Index**
Basil leaves	160g	1 litre	6.25
Oregano leaves	92g	1 litre	10.87
Allspice Ground	440g	1 litre	2.27
Nutmeg ground	520g	1 litre	1.92

  Therefore it can be seen that as the product gets heavier relative to the amount of volume it occupies, the *Bulk Index* becomes lower. Something that weighs 1,000 grams per litre (eg. water) has a bulk index of 1.

  Because in reality no commodity would ever have a completely consistent *Bulk Index*, it is generally quoted in a specification as a range, e.g.
  Basil Leaves 35g to 45g per 250mLs. = B.I. range 7.14 to 5.56

  Retailer and thus re-packer treatment of herbs is market them in the one size pack and, most commonly, at the same price. What does differ however is the volume in the pack.

3.3.4 Chemical

The chemical attributes of *volatile oil* and *residues* can be measured by laboratory tests and, as with physical attributes, are assessed on the basis of existing standards.

Volatile Oil is a measurement of the volatile oils contained in the material and in general may be considered as an indication of the relative flavour strength of the sample.

Residues are a very topical issue. Increasingly, buyers are concerned about chemical residues from pesticides and high levels of heavy metals.

3.3.5 Microbiological

Because herbs and spices are used as ingredients with a diverse range of foods that are handled and stored in a wide variety of conditions, the TPC (total plate count) of bacteria in herbs and spices is critical. A high TPC may have a significant impact on either the shelf life of the product or in a worst case scenario, cause food poisoning especially if salmonella were present.

Sterilized herbs and spices have been treated with either ethylene oxide gas or heat treatment. Irradiation is another method used in many countries to sterilize herbs and spices. The United States, for example, has been reluctant to adopt the widespread use of irradiation in food. Yet approval to irradiate herbs and spices is well over 15 years old. At the time of writing this report irradiation had not been approved in Australia as a method of sterilizing herbs and spices.

3.3.6 Organoleptic

Possibly the most subjective criteria, which after all the measurable tests have been conducted, will determine whether the material is suitable.

Aroma and *flavour* attributes may differ more than the volatile oil content levels indicate, and could be determined by cultivar or soil and climatic conditions. Spearmint grown in Nizip near the banks of the Euphrates in South Eastern Turkey may have the same volatile oil as spearmint from Morocco, however the flavour character is completely different.

3.3.7 GMO Status

All interviewees stated that they would expect material to be free from any Genetically Modified material.

4. Market overview

This section consolidates the key points and issues that interviewees made about their buying requirements for herbs in general and each of the individual items surveyed. The forms of *Fresh, Frozen* and *Dry* are discussed separately. Each form has an Estimated Annual Quantity (EAQ) amount beside it in metric tons. These figures have been either gathered from market data, import statistics, or are extrapolations of survey data from major buyers.

General comments that are not of a variety specific nature are dealt with first to present a clear picture of the overall market dynamics.

4.1 Fresh Herbs

The majority of fresh herbs are distributed through the capital city produce markets in the same manner as most fresh fruit and vegetables. A proportion is grown by small producers who sell direct in the grower's market area with the greater volume produced by larger growers being sold through the main agents. Each market has a handful of agents who tend to specialise in exotic fruits, herbs and vegetables. Depending upon seasonal availability, these agents will also check out the grower's market first thing, and supplement their regular grower's offerings with whatever is available.

Consistency of quality is regarded as the most important criteria for buying. At the same time consistency in fresh herbs is more straightforward to determine than in frozen or dried ones. Price is determined by market forces, thus a common problem with the fresh herb market has been when moderate success with an item has led to excess production relative to the market requirements leading to a severe drop in prices.

Microbiological specifications and standards for residues appear to be non-existent, a benefit the local growers of fresh herbs are experiencing when compared to the rigorous testing of imported dried material that is undertaken by AQIS.

Because Australia has a wide diversity of climatic conditions and airfreight is relatively efficient, Seasonality in general is not a major issue, however some individual herbs are constantly subject to short supply in the southern winter.

All fresh herbs sold in Australia appear to be locally grown with almost no evidence of fresh herbs being imported.

4.2 Frozen herbs

Frozen herbs are still a small segment of the market. All are imported. They are bought mostly by food manufacturers who want the appearance and flavour of fresh herbs combined with the benefits of frozen storage. These frozen herbs are generally referred to in the trade as IQF products (Individual Quick Freezing) a process that snap freezes the leaves and creates a convenient free-flowing material. Buyers did comment though that after being freighted to Australia and then stored for extended periods, imported IQF herbs lost their free-flowing characteristics and were not always as convenient as they could be when batching into production.

4.3 Dried Herbs

Dried herbs represent an immense proportion of the market, especially when one considers that the fresh weight is reduced to one third or less of the harvested weight by the time the herb is dried and cleaned. Most dried herbs sold in Australia are imported and at the risk of making a gross oversimplification, this can be attributed to 5 key factors.

(i) Key producing countries such as Egypt, Turkey, Greece, Morocco, Israel and China have a long history of culinary herb production. The cultivars are compatible with the environment and an established tradition of harvesting, processing and post-harvest handling means that little or no investment is required to optimise production.

(ii) In many areas plants growing in the wild are gathered further reducing investment costs.

(iii) The majority of countries producing herbs have a climatic situation that is ideal for drying. Low humidity and plenty of no-cost heat from the sun means that these producers have no capital investment to make in dehydration equipment and they have no energy costs.

(iv) Generally these countries have labour rates that are low, therefore the processes of harvesting, drying and even some rudimentary cleaning can be carried out on demand and at a low cost.

(v) The producing countries have been supplying world markets for so long that their quality has become the accepted standard. Therefore any new entrant into the market would have to either match this quality or provide buyers with compelling reasons to change established standards.

The market for all dried herbs is price sensitive and because a dried item can be stored and is less likely to be influenced by seasonality when compared to fresh produce, harvesting peaks and troughs tend to be smoothed out providing little opportunity for price hikes during times of shortage.

Freeze Dried herbs have limited application with the exception of chives. The invention of freeze-drying has had a more profound effect upon the popularity of chives in the 20th century than on any other herb or spice. Freeze-drying is a sophisticated, capital intensive method of dehydration which removes moisture from plant material without damaging delicate cell structures. Basically, after harvesting and grading by hand the chives are frozen, then in a vacuum chamber, moisture as ice is taken to the gaseous state in the form of vapour, without turning into water in the process. The result is that cell and flavour destroying latent heat is not produced during dehydration, thus yielding a finished product that has all the colour, shape and flavour of fresh chives and only lacking the moisture. Because the moisture in many foods is sufficient to re-hydrate freeze-dried chives, they do not need to be re-constituted before using and can be added direct to cream cheeses, sauces, dressings, mashed potato and scrambled eggs to mention just a few applications.

The physical, chemical and organoleptic properties of imported herbs generally meet buyer's requirements. Residues do not appear to a major issue as many producing countries avoid making the investment in chemicals to assist production. It could be argued that many of these herbs are close to organic without actually being certified as such.

For similar reasons, all the herbs that were investigated during this research were claimed by all suppliers to be GMO free.

Microbiological standards are not always within specification and often require sterilization, particularly when those commodities are going to be used in a high risk food application.

Metal detection is another issue that importers are concerned about and an increasing number of them are checking shipments upon arrival.

5. Specific herbs

5.1 Basil

English:	*opal basil, lemon basil, cinnamon basil, sweet basil, Greek basil, holy basil* ***O.sanctum,*** *garden basil, tulsi, wild basil* ***O.campechianum****, camphor basil* ***O.kilimandscharicum*** *bush basil* ***O.minimum****, Thai basil* ***O. cannum Sims****.*
Hindi:	*babuitulsi*
India:	*sabzah, tulas* ***O.sanctum,*** *gulal tulasi*
Indonesia:	*selasih, kemangi*
Malaysia:	*selasih, kemangi*
Philippines*:*	*belanoi, sulasi*
Sri Lanka*:*	*suwenda-tala, madura-tala*
Thailand:	*hai horapha, hai kaprow, hai manglak*
Vietnam*:*	*rau que*

Description

There are many different types of basil, however the succulent, large-leaved, sweet basil is by far the most popular variety for culinary use. Basil's refreshing, clove and anise-like aroma conjures up memories of summer, hardly surprising when one considers how this warmth-loving annual thrives in the heat and expires with the first chills of winter.

Sweet basil plants grow to around .5 m high and even more in ideal conditions. Stems are tough, grooved and square with dark-green, oval, crinkly leaves from 30mm to 100mm long. The tiny, white, long-stamened flowers should be nipped off to prevent the plant from going to seed and finishing its life-cycle. This will also encourage thicker foliage and hence more abundant harvests.

The taste of sweet basil is far less pungent than the permeating, heady aroma of the freshly picked leaves would suggest, thus large quantities can be used with safety.

Dried sweet basil leaves are quite different from the fresh, and although the fragrant, fresh-smelling top notes disappear upon drying, a concentration of volatile oils in the cells of the dehydrated leaves give a pungent clove and allspice bouquet. This is matched by a faint minty, peppery flavour that is ideal for long, slow cooking.

Other varieties of basil are

- **Bush Basil *O. minimum*** which has small leaves 10mm to 15mm long, it grows to about 150mm high, the foliage has a less pungent aroma and lower flavour-strength than sweet basil.

- **Purple basil**. The two types of purple basil, serrated leaved 'purple ruffle' and the smoother 'dark opal basil' mainly grown for decorative purposes, have a mild pleasing flavour and look attractive in salads and as a garnish.

- **Hairy basil *O. cannum Sims*** or 'Thai basil' has slender oval leaves with deep serrations on the edges and a more camphorous aroma than sweet basil. Although the seeds of this variety have no distinct flavour, they swell and become gelatinous in water and are used in Indian and Asian sweets, drinks and as an appetite suppressant.

- **Holy basil** *O. sanctum* as it is called in India, has mauve-pink flowers, is perennial and is lightly lemon-scented.

- **Cinnamon basil** has a distinct cinnamon aroma, it has long, erect flower-heads and is an attractive plant as well, the leaves compliment Asian dishes.

- **Camphor basil** *O. kilimanscharicum.* This variety is not used in cooking but rather as a decorative herb in the garden.

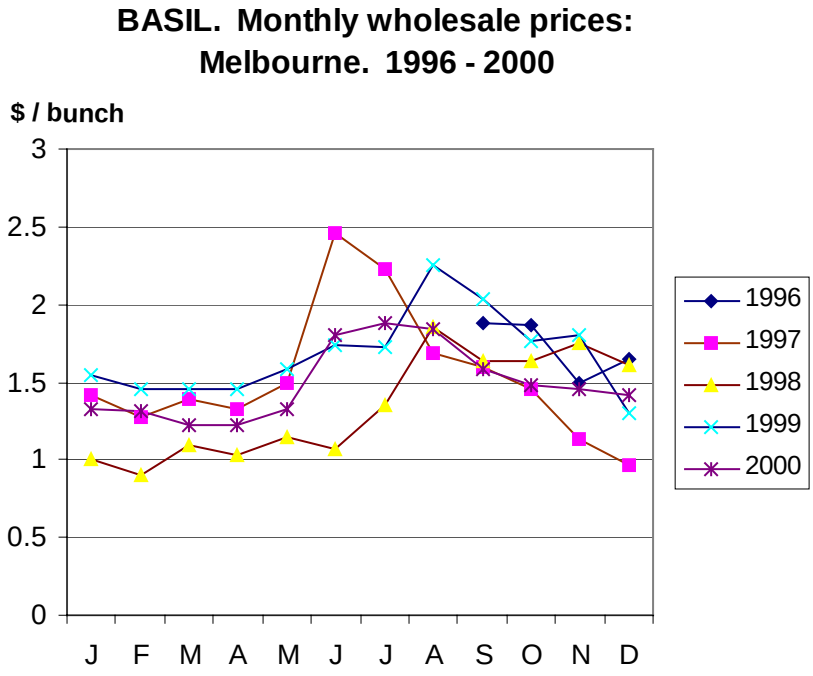
5.1.1 Fresh Basil

Estimated Annual Quantity.
Unable to be established for Fresh Basil or Fresh Thai Basil.

Approximate Market Price.
S15.00 / kg

Prices rise in winter and decline in summer, see Fig.1.

Fig.1

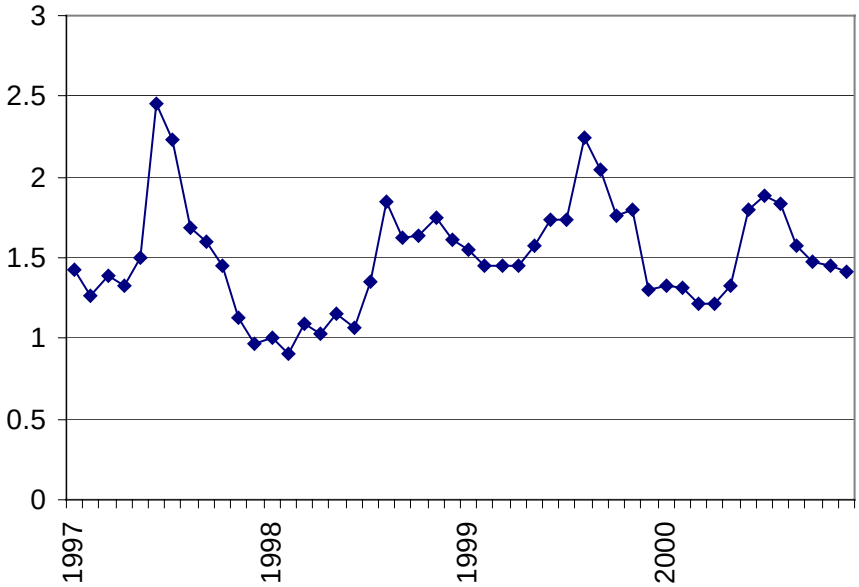


Source: Ausmarket Consultants

The trend price shows a slight upward movement, see Fig. 2. A distinct high price season followed by a low price season is evident.

Fig.2

BASIL. Wholesale price trend , 1996 - 2000



The wholesale bunch price for Sweet and Bush Basil converts to approximately $15 / kg.

Although sweet basil represents the lion's share of the market, some of the more specialised distributors will carry bush basil, Greek basil, Thai basil and purple basil from time to time. A recurring comment was that a lot of suppliers of the unusual varieties turn out to be one-off growers, who either switch to something else or disappear altogether.

Whilst those interviewed stated that seasonality does not appear to be a major issue as sufficient supplies come from the north of Australia during winter to meet the demand, the data as recorded at the Melbourne wholesale market suggest otherwise. In each of the four complete years for which data is available, the low:high ratio never went below 1:1.54, that is prices varied by 54 percent over the one year.

Some users of frozen basil expressed an interest in fresh material, if it was possible to present it in a ready prepared state to use in manufacturing with no further processing required.

5.1.2 Frozen Basil

Estimated Annual Quantity:
50 MT

Approximate Market Price:
Not available.

IQF basil appears to be the most popular frozen herb in current use in Australia. The increase in demand for pasta products that contain basil, plus the growth in chilled ready prepared meals has made this a much sought after herb. Users are not able to handle fresh basil within their production processes, so this is an ideal substitute. The problem of it losing its free flow characteristics during storage was sighted as a common problem.

Buyers also commented that the cost of IQF herbs has dropped dramatically (30-50 percent) during the last few years, possibly due to increased availability and competition among suppliers.

5.1.3 Dry Basil

Estimated Annual Quantity:
150 MT

Approximate Market Price:
$2.00 - $2.50 per MT.

Much of the dried basil that is imported comes from Egypt. Buyers have no major problems with the material that is currently available.

Re-packers did comment that bulk index has been an issue from time to time and that consistency in this area of the specification is critical. Sometimes the rigours of handling during transit can break the leaf size down and produce dust. As a result, importers often have to clean the material to achieve a uniform appearance and consistent bulk index.

5.2 Chervil

Common names: cicily, sweet cicily, garden chervil, gourmet's parsley

Description:

Chervil is a shade-loving biennial that cannot tolerate hot, dry conditions. The small plant grows to around 30cm high and has bright green, frond-like leaves resembling a miniature parsley. Flowers are minute and white producing long, thin seeds which are not used in cooking. The aroma of freshly bruised chervil leaves is grassy and delicately anise-scented, the flavour is similar to French tarragon. Dried chervil leaves have a 'hay-like' aroma and flavour of parsley, having lost most of their lighter anise notes during dehydration.

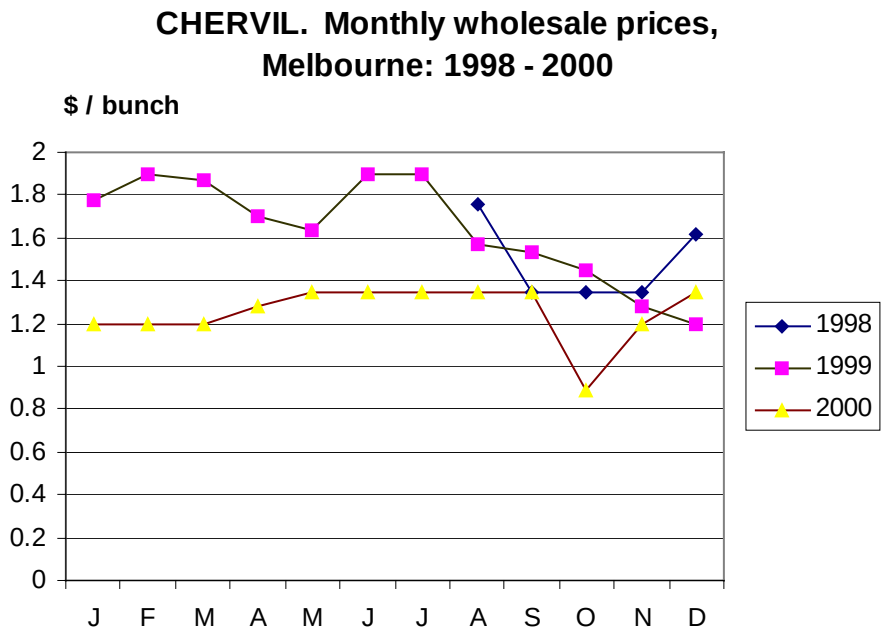
5.2.1 Fresh Chervil

Estimated Annual Quantity
Unable to be established.

Approximate Market Price

Although wholesale price data was collected, it was considered too small a data set upon which to make realistic comments, see Figure 3.

Fig. 3



Source: Ausmarket Consultants

Industry sources suggested a price of around $15.00 / kg.

Fresh chervil is used by many professional chefs. The majority of Australia's production, which is from Victoria, appears to be absorbed by the food service market. It possibly does not appear much at retail level due to a lack of consumer awareness. However this is changing with the development of the pre-packs in a number of supermarket chains. As a fresh herb it does not keep as well in the home as many other more robust herbs do, such as parsley.

5.2.2 Frozen Chervil

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

Frozen chervil is available, however it is not used widely in food manufacturing and the quality is not deemed to be appropriate for restaurant use.

5.2.3 Dry Chervil

Estimated Annual Quantity
Less than 12 tonnes.

Approximate Market Price
Around $13.00 /kg

Dried chervil is sold by some re-packers and a small amount is used in the food service industry. The general opinion is that the dried form is inferior to fresh and parsley is an adequate substitute in most manufacturing situations where dried may have some application.

5.3 Chicory

Other common names: Belgian Endive, Succory, Witloof

Botanical Name: ***Cichorium intybus***

Description

Chicory almost looks like two plants in one, having broad, light green, lance-shaped lower leaves resembling spinach and small, sparse upper leaves clasped to a tangle of branching stalks that grow to 1.8 m high. Attractive, pale blue flowers the shape of daisy blooms in clusters of two or three on the tough higher stems. These flowers will close by the time the bright midday sun has bathed them, yet remain open on cloudy days. While the more mature, dark green, lower large leaves are extremely bitter, young, pale leaves are milder and can be used readily.

Chicory is a perennial with a long tap root similar to a dandelion and it is this tap root which is roasted and used as an additive to coffee[1]. Belgian endive is the name often given to the blanched, white vegetable form seen in many greengrocer's shops, the flavour being succulently refreshing and appetisingly bitter with a crisp mouth-feel.

5.3.1 Fresh Chicory

Estimated Annual Quantity

Unable to be established.

Approximate Market Price

$15.00 / kg.

5.3.2 Frozen and dehydrated chicory

These do not appear to be available and because of the specific nature of fresh chicory there is unlikely to be any opportunity for it in either frozen or dehydrated forms.

[1] Victorian production of chicory for coffee was at one stage sufficiently strong as to warrant there being a Chicory Marketing Board. Evidence of the industry can be seen with the old drying kilns down on the Mornington Peninsula. Another form of evidence is the lack of trees in the area, they having been cut to provide fuel for the drying kilns. And evidence of irony is provided by the fact that when Victoria had its Chicory Marketing Board, the plant was a declared noxious weed in South Australia.

5.4 Chives

Allium tuberosum, A.odorum, A.schoenoprasum

China	*jiu tsai, gau tsoi, gau choy fa*
English	onion chive ***A.schoenoprasum***, rush leek, *Chinese chive, garlic chives* ***A.tuberosum***
Indonesia	*kucai*
Japan	*nira*
Malaysia	*kuchai*
Philippines	*kutsay, ganda, amput, imayyaw*
Thailand	*kuichai, hom-paen*
Vietnam	*he*

Description

When not in flower, this herb more closely resembles a clump of grass than one of the world's most popular culinary herbs. There are two varieties of chives, the smallest member of the onion family that also includes garlic, leek and shallot, onion chives and garlic chives. Each is named for its characteristic onion and garlic flavours respectively, a result of containing considerably less sulphur than their larger cousins. The leaves only are eaten, as the small, elongated bulb is virtually non-existent.

Onion chives grow from 15 to 30 cm high, have slender, bright-green, grass-like leaves tapering at the top and becoming more tubular in cross-section as they develop. Masses of ribald, mauve-pink, pom-pom shaped flowers, constructed of cylindrical petals adorn the plant in summer, making it a favourite for botanical artists to represent in kitchen posters.

Garlic chives grow a little taller than onion chives and the mature, light-green leaves are distinctly flat by comparison. The flowers of garlic chives are white and form on tough stems that are unsuitable for eating.

Both varieties of chives are particularly valuable for their subtle onion and garlic flavours, delivered in a green, fresh-tasting medium lacking the pungency of onions and garlic.

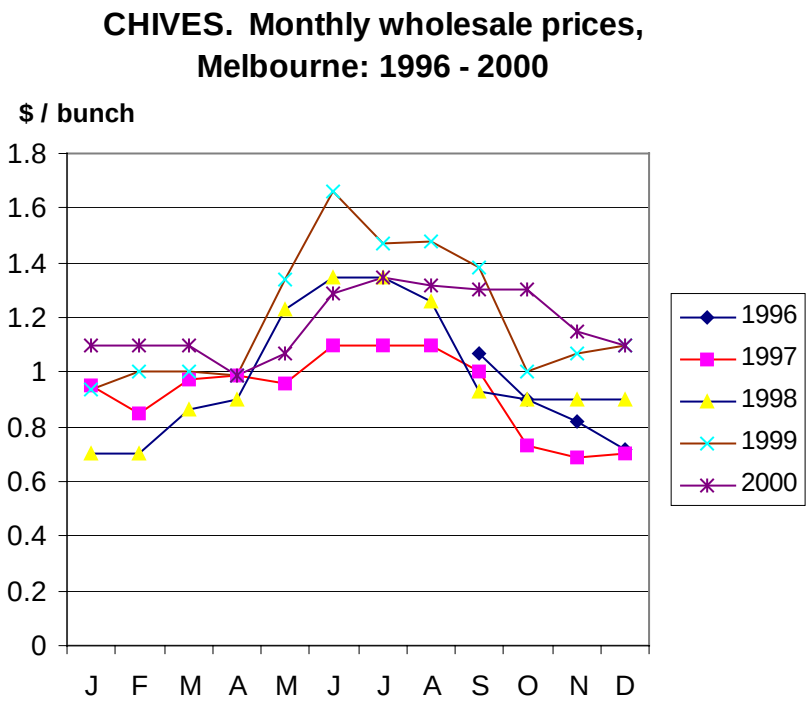
5.4.1 Fresh Chives

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
$15.00 / kg

Prices rise in late autumn, peak in mid-winter and drop sharply in spring, see Figure 4.

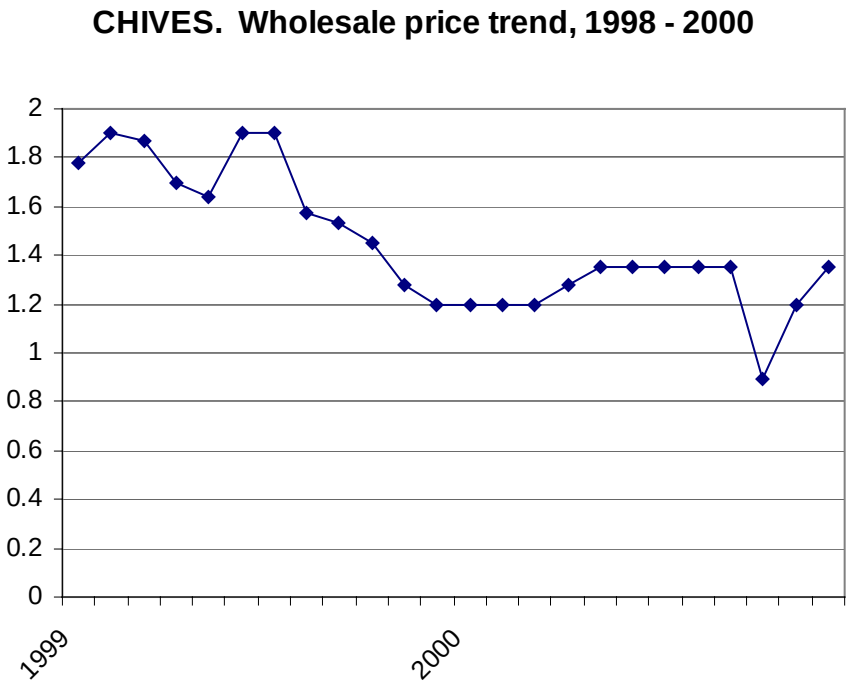
Fig. 4



Source: Ausmaket Consultants

The long term price trend is disturbingly sharply down, see Fig.5

Fig.5



While most of the chives sold are onion chives, the popularity of garlic chives is increasing. The price data does not enable this distinction to be quantified.

Because of the flat leaf, garlic chives are not as popular as a garnish. Some sellers commented that the flower buds of garlic chives have been in demand among the Chinese community. These are generally referred to as “chives flower”.

Supplies of both onion and garlic chives appear to be coming into the markets from existing market gardeners rather than specialist herb growers.

5.4.2 Frozen Chives

Estimated Annual Quantity

Unable to be established.

Approximate Market Price

Unable to be established.

IQF onion chives are available. However the performance of freeze-dried chives is so close to fresh when used as a manufacturing ingredient, it seems that the market for frozen chives is limited.

5.4.3 Dry Chives

Estimated Annual Quantity

Air Dried:	10 MT
Freeze Dried	4 MT

Approximate Market Price:

Air Dried	$12.00 kg
Freeze Dried	$48.00 kg.

Chives are a popular ingredient in processed foods, especially dry packet instant meals/soups/sauces and other convenience-based products that need to re-hydrate quickly. Chives add colour and flavour and although relatively expensive per kilogram, have a high bulk index, so not very much weight has to be used to achieve a visibly significant effect.

The greater proportion of air dried chives imported come from China (and strictly speaking are a most commonly shallots) while freeze dried chives are imported from Denmark and the U.S.A.

5.5 Coriander

Coriandrum sativum

Afghan:		*gashneez*
Arabic:		*kazbarah*
China*:*		*yuen sai*
English	:	*Chinese parsley, cilantro, Fragrant Green, Japanese parsley*[2] *perennial coriander* **Eryngium foetidum**
French		*coriandre*
German		*koriander*
Hindi*:*		*dhania pattar, hara dhania, kothmir*
Indonesia*:*		*daun ketumbar*
Malaysia*:*		*daun ketumbar*
Philippines*:*		*ketumbar*
Sri Lanka*:*		*kothamalli kolle*
Thailand*:*		*pak chee*
Turkey:		*kisnis*
Vietnam*:*		*ngo*

Description

The coriander plant provides a distinctive culinary herb - leaf and root - usually associated with Asian food, and an essential spice - fruit or seed - used throughout the world in both sweet and savoury cooking.

Coriander is a vigorous annual, which grows to about 80cm tall and has dark green, fan-shaped leaves resembling Italian parsley. The stems are slender and branched, the lower leaves quite round but becoming more divided and serrated further up the stem. A profusion of small, umbrella-shaped, pale pink, mauve to whitish flowers form and produce the seeds. Coriander leaves, also referred to as cilantro, have a fresh, grassy, pervading, insect-like aroma and lemony, clean, appetising taste.

Observations suggest that about ten percent of the population in Australia do not like the flavour of fresh coriander leaves, perhaps justifying the term 'fetid', which many 20th century European writers used to describe its aroma.

Coriander seeds, which attain a completely different character upon drying, are small and almost spherical, 5mm in diameter and ribbed with more than a dozen longitudinal lines like a tiny Chinese lantern. Two types of ***Coriandrum sativum*** seeds are generally available:

- Light-tan to pale brown types. These are the most commonly seen seeds. They have a delicious taste reminiscent of lemon peel and sage.

- So-called Indian or green variety which is the same size, more egg-shaped, pale yellow with a greenish tinge and tasting a little like the fresh leaf.

[2] Yet in Japanese, coriander is called "koendaro".

Coriander seeds have a papery husk, and even when ground finely retain a coarse, sand-like texture which should not be gritty, the fibre taking up moisture and helping to thicken curries and spicy sauces.

5.5.1 Fresh Coriander

Estimated Annual Quantity

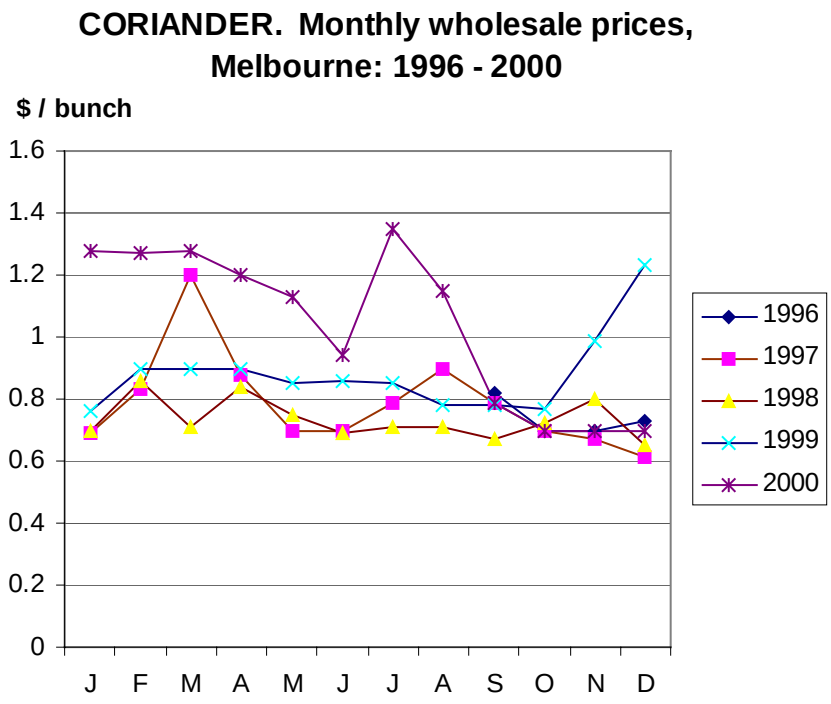
Unable to be established.

Approximate Market Price

$15.00 / kg

Monthly wholesale coriander prices are more erratic than the other herbs, see Figure 6.

Fig. 6

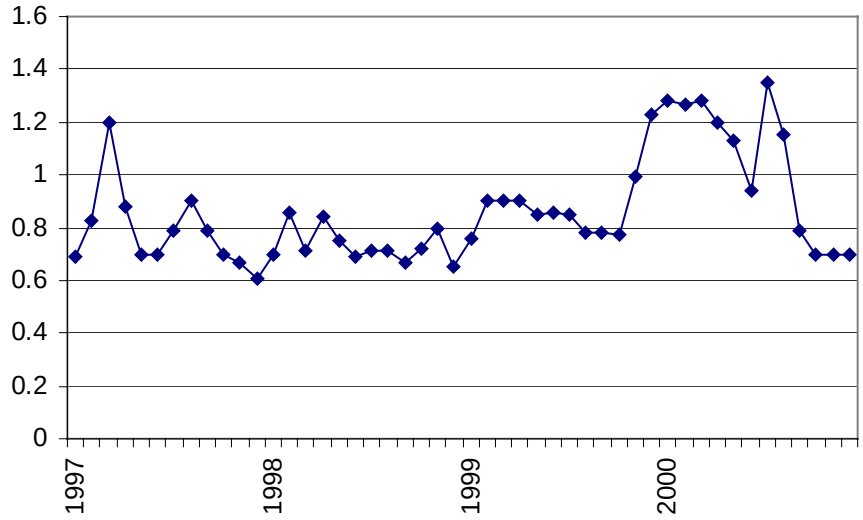


Source: Ausmarket Consultants

The long term price trend is encouraging, see Fig. 7

Fig.7

CORIANDER. Wholesale price trend, 1996 - 2000



The popularity of Asian cuisine in Australia has made coriander leaf (including the stems and roots that are also used in cooking) as familiar as basil and parsley. There always appears to be abundant quantities available at the produce markets, with ready supplies coming from Queensland and the Northern Territory during the southern winter.

5.5.2 Frozen Coriander

Estimated Annual Quantity
Unable to be established

Approximate Market Price
Unable to be established

With similar dynamics to basil, IQF coriander is sought after by food manufacturers wishing to replicate the fresh flavours characteristic in Asian cuisine. Complaints about its lack of free flowing capabilities after a period of frozen storage are common. Even with this drawback, few buyers would resort to dehydrated coriander leaf as a substitute.

5.5.3 Dry Coriander Leaf

Estimated Annual Quantity
5 MT

Approximate Market Price
$12.00 / kg

5.5.4 Coriander Seed

Estimated Annual Quantity
500 MT

Approximate Market Price
Seed $600 per MT

Dehydrated coriander leaf suffers from the fact that its flavour and aroma is under-whelming when compared to fresh. The reason that it does not experience the popularity enjoyed by dried basil (a herb that one could level the same argument at) is that dried basil has centuries of traditional use during the European winters. Alternately in tropical Asia, a dried substitute for fresh coriander has never been a requirement.

Coriander seed on the other hand is a significant crop in Australia and the 500 tons consumed locally only represents about one third of the total amount produced and exported. Because coriander can be harvested with a wheat header and appears to thrive in the wheat producing areas of New South Wales and South Australia it is the one mainstream spice that Australia has been able to produce economically. Most of the coriander seed bought in Australia is locally grown with a very small amount being imported.

5.6 Dill

Anethum graveolens (syn***. Peucedanum graveolens)***

Afghan:	*shabit*
English	*aneto, dill weed/dill herb and European dill (**A.graveolens**), Indian/Japanese Dill (**A.sowa**), dill seed, garden dill, green dill*
French	a*neth*
Greek:	*anitho*
India*:*	*anithi*
Indonesia*:*	*adas mani*
Italian	*aneto*
Spanish	*eneldo*
Sri Lanka*:*	*enduru*
Thailand*:*	*phak chee lao*
Turkish*:*	*dereotu*

Description

The herb dill, commonly called *dillweed*, is a surprisingly hardy, delicate-looking, frond-like annual which has the appearance of a small version of fennel. Dill plants grow to about 1 metre high, and have wispy, hair-like leaves at the top of upright, smooth, shiny, hollow stems. Dill, with its small, pale yellow flowers is a member of the same family as parsley, caraway, anise, coriander and cumin. It bears similar umbrella-shaped flower heads followed by seed clusters. Fresh dill tips have a distinct parsley-like aroma and subtle hint of anise.

The seeds, which are actually the minute fruit divided in two, are pale brown with 3 fine, lighter coloured lines or oil channels running the length of the seed. Each seed is about 4 mm long and oval, as most split in two after harvesting. The majority of dill seeds look flat on one side and convex on the other, with a few seeds retaining a fine, 1 mm stalk.

Dill seeds have a more robust aroma and flavour than green dill tips, for upon drying a distinct anise character and suggestion of caraway develops while the parsley overtones, found in fresh dill leaves, disappear. Dried green dill tips are dark green, fine and each piece is only between 2 and 4 mm long. The aroma is grassy, but more aromatic than many dried herbs and when placed in the mouth, softens quickly to release a parsley and anise flavour reasonably close to that of fresh dillweed.

The variety grown in India and Japan *(Anethum sowa)* is a smaller plant than European dill and has a less agreeable flavour. Instead, it provide the oil extracted by steam distillation which is widely used in the manufacturing of pickles and processed foods.

5.6.1 Fresh Dill Weed

Estimated Annual Quantity

Unable to be established.

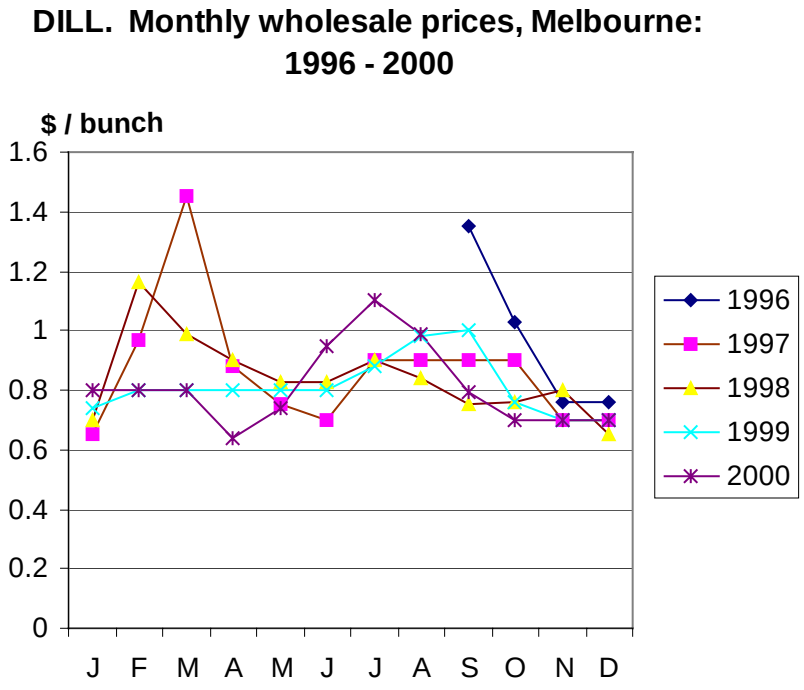
Approximate Market Price

$15.00 /kg

Fresh dill is used widely in restaurants having achieved ubiquitous status with smoked salmon, along with capers. As for other fresh herbs, dill is produced by relatively conventional growers and is sold through the fresh produce markets. Users expressed little concern about existing sources of supply.

Prices appear to have a twice a year peak: late summer and early spring, see Fig. 8

Fig. 8

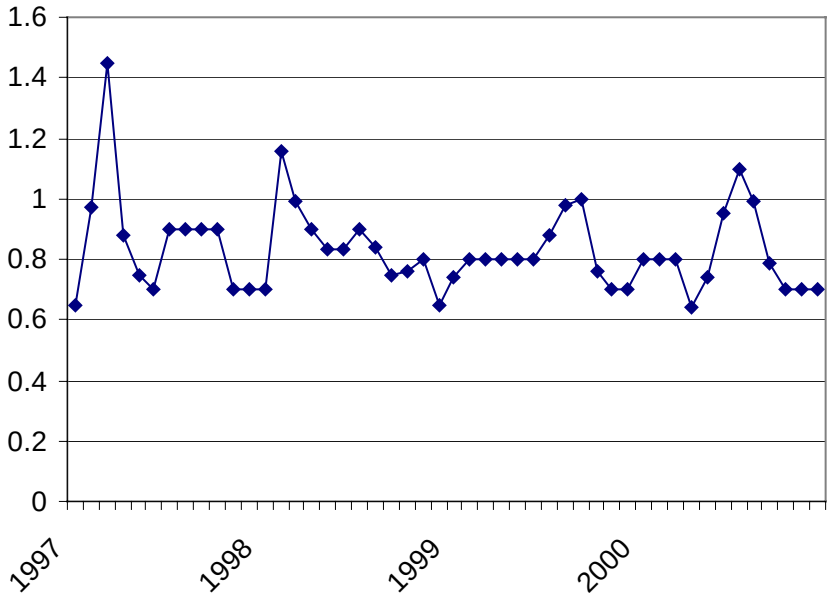


Source: Ausmarket consultants

There is no discernible long term price trend, see Fig.9.

Fig. 9

DILL. Wholesale price trend, 1996 - 2000



5.6.2 Frozen Dill Weed

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

There appears to be relatively low demand for IQF dill weed. This is probably due to the fact that dried dill performs surprisingly well in manufactured goods for a dehydrated herb.

5.6.3 Dry Dill Leaf

Estimated Annual Quantity
25 MT

Approximate Market price
$12.00 / kg

Dehydrated dill leaves retain much of the flavour of fresh green dill tips. Green dill is a colourful and tasty ingredient to add to dry packet foods, refrigerated seafood products and sauces and even reconstitutes effectively at restaurant level.

The only comment made by buyers was some concern over the incidence of white tips/stalks among the green leaves, spoiling their aesthetic appeal.

5.6.4 Dill Seed

Estimated Annual Quantity
5 MT

Approximate market price
$1.20 / kg

Dill seeds are traditionally used in pickles, however much of the dill flavour that is used in dill pickles these days is the volatile oil.

5.7 Mint

Mentha spp.

Afghan:	*nauna*
Arabic:	*na'na*
China	*yang po ho, paoh-ho*
English	*Garden Mint, Common Mint, Green Mint, Lamb Mint, Our Lady's Mint, Peamint, Sage of Bethlehem, Spire Mint, Spearmint (**Mentha spicata**, **M. crispa, M. viridis**), Peppermint **M. piperita officinalis,** Applemint **M. rotundifolia**, cornmint, watermint, Japanese peppermint, American wild mint, Egyptian mint, Corsican mint, woolly mint, European horsemint, licorice mint, ginger mint, basil mint, lemon mint, Eau-de-cologne mint, **M. piperita citrata**, pennyroyal **M. pulegium**.*
Greek	*thiosmos*
India	*podina*
Indonesia	*janggat*
Malaysia	*daun pudina, pohok*
Philippines	*yerba buena*
Thailand	*bai saranae*
Turkey	*nane*

Description

The mint family encompasses a vast array of varieties, a situation brought about by its tendency to hybridize readily within the species. Among all of these, spearmint stands out as the most useful and popular culinary herb. Applemint is another widely used species. Peppermint is widely favoured medicinally, and it flavours sweets and is found in many breath-freshening applications.

Spearmint is generally seen in two forms:

- Mid to light green, narrow-leaved, and low growing.
- Coarser, round, crinkly-leaf variety called in Australia "common" and "garden mint".

Spearmint has a distinct mint aroma and pleasing light flavour that is not pungent, warm or too antiseptic.

Peppermint leaves on the other hand are more oval than spearmint leaves; they are dark green with an almost peppery heat, an obvious mouth-freshening, germicidal characteristic, and sweet, balsamic taste which makes one think of peppermint throat lozenges immediately. There are two types of peppermint; one is referred to as 'black' peppermint, which has dark, almost purple stems and the other, 'white' that has green stems.

Applemint, also called pineapple mint, has leaves that are crinkly, sometimes variegated, and look very like common mint except for a covering of light down, giving them a soft, fuzzy appearance. Their flavour is similar to spearmint with a pleasing hint of green apple taste.

Eau-de-cologne mint is taller and more erect than spearmint and peppermint and is grown for decorative purposes and the refreshing eau-de-cologne fragrance it gives off when brushed past in the garden.

Pennyroyal is a low growing ground cover mint with small, light green leaves; it should not be eaten, but when picked and put under the pet dog's blanket it will deter fleas.

5.7.1 Fresh Mint

Estimated Annual Quantity

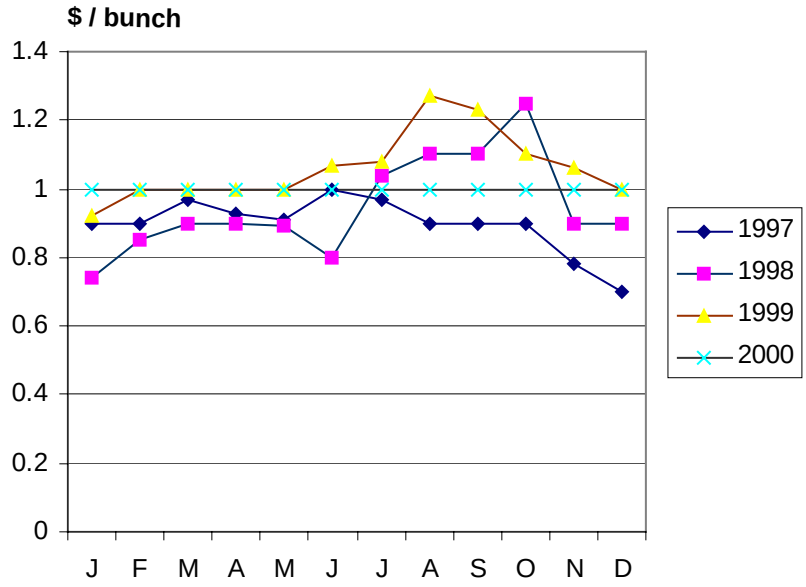
Unable to be established.

Approximate Market Price

Around $1.00/ bunch. See Fig.10.

Fig. 10

MINT. Monthly wholesale prices, Melbourne: 1997 - 2000



Source: Ausmarkets Consultants

There is unease about commenting on the long term price trend because of the suspiciously flat price recorded for 2000.

5.7.2 Frozen Mint

Estimated Annual Quantity

Unable to be established.

Approximate Market Price

Unable to be established.

5.7.3 Dry Mint

Estimated Annual Quantity
30 MT.

Approximate Market Price
$3.50 / kg.

5.8 Oregano and Marjoram

Majorama hortensis
Origanum majorana, O.onites

English — *Sweet Majoram, Knotted Majoram, Sweet Marjoram, Knotted Marjoram, Pot Marjoram* ***O. onites****, Winter Marjoram* ***O. heraclesticum,*** *Rigani,* Wild Marjoram. Oregano **O. vulgare,** Greek Majoram/Greek Oregano, Italian oregano **Origanum ×majoricum**, small-leaved oregano **Origanum *microphyllum***, *Syrian oregano* ***Origanum syriacum***

Description

Marjoram and oregano are grouped together here because they are so closely related and similar that it seems unnecessary to classify them separately.

Sweet marjoram, the variety most often used in cooking, is a reasonably dense perennial that grows from 30 to 45 cm high. In cold climates it will become dormant or die right back in winter. The leaves are deep green, up to 3 cm long, lightly ribbed, slightly darker on top and pale on the underneath side, and oval to elongated in shape. Both marjoram and oregano have tiny white flowers, knotted marjoram being characterised by its flowers bursting out from tight green knots at the tips of the stems. Oregano (wild marjoram) is more robust and spreading in appearance than sweet marjoram, it thrives as a perennial in most climates, grows to around 60 cm tall, has much rounder leaves and is covered by a down of fine hairs.

The flavour and aroma of marjoram is mildly savoury, grassy and resembles thyme. Dried marjoram leaves are also like a mild version of thyme with an agreeable bitterness and lingering camphor quality. Oregano on the other hand, has a more piercing scent than marjoram and its flavour is stronger, in keeping with its bold appearance, and when dried has a pleasing depth of taste with a distinct, sharp, peppery element to it.

There are a number of different types of ***Origanum*** that grow wild in Greece and are variously referred to as *rigani*. The flavours, and to a lesser degree the appearance, of the different types of oregano can vary greatly depending upon climatic and soil conditions, making it difficult to find outside its homeland.

Pot Marjoram ***O. onites*** has an inferior taste to sweet marjoram and is not cultivated widely, although it was introduced into England in the 18th century and tends to be grown as a substitute in areas that are too cold for sweet marjoram.

5.8.1 Fresh Oregano

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
$15.00 / kg.

Fresh Marjoram

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
$15.00 / kg.

Fresh oregano and marjoram are readily available through the produce markets being supplied by a number of traditional market gardeners.

Marjoram is not as popular as oregano. It tend to be more effected by seasonality than its robust cousin, oregano.

5.8.2 Frozen Oregano

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

A growing market for refrigerated fresh convenience meals and pasta sauces has increased demand for IQF oregano. Dehydrated oregano does flavour these foods effectively, so the desire for the flavour profile of fresh oregano is not quite as intense as it is for fresh basil and coriander leaf.

5.8.3 Dry Oregano

Estimated Annual Quantity
220 MT

Approximate Market Price
$4.50 kg

Dehydrated oregano is in high demand for both re-packing and for use in manufacturing. An issue cited by industry is the propensity for less than scrupulous traders to blend marjoram with oregano when oregano is in short supply and the cost is high. Bulk index inconsistency is also an issue that is of some concern to re-packers.

5.8.4 Dry Marjoram

Estimated Annual Quantity
80 MT

Approximate Market Price
$4.00 kg

5.9 Parsley

Petroselinum crispum

Arabic	*bakdounis*
English	*Curled Parsley* ***Petroselinum crispum****, Italian Parsley* ***P. crispum neapolitanum****, Hamburg Parsley* ***P. sativum*** *Triple-Curled Parsley, Moss-Curled Parsley, Flat-Leaf Parsley, Large-Leaf Parsley.*
Greek	*maidano*
Turkey	*maydanoz*

Description

Curled parsley is the variety most often used in cooking and as a garnish. It grows to around 25 cm high and is easily recognised by its masses of small, tightly bunched, bright-green leaves. There are over 30 variations of curled parsley, some kinds may be more tightly curled and others relatively sparse. There is also the Italian or large-leaf parsley, which grows to 45 cm, is a darker-green than curled parsley, looks a bit like the tops of celery and has a slightly stronger flavour. The aroma and taste of parsley is particularly distinct for a herb that is generally described as being mild and subtle. This is because parsley compliments most flavours it is put with and never seems to dominate, yet always manages to make its presence felt. Hamburg parsley is grown for its parsnip-like root that is cooked and eaten as a vegetable, in much the same way as fennel bulbs are.

Fool's parsley ***Aethusa cynapium*** is a poisonous plant that looks very similar to Italian parsley. It is found in English gardens sometimes growing among real parsley. Fool's parsley has a disagreeable flavour. Many people have inadvertently gathered it with parsley, eaten it and subsequently become ill. This may explain why the curled varieties are by far the most popular in England. Chinese parsley is a common name often given to fresh coriander leaves.

5.9.1 Fresh Parsley

Estimated Annual Quantity

Unable to be established.

Approximate Market Price

Very difficult to determine.

Data are available for "continental", "english", and "all". Adequate time data sets are not available. Prices are very similar.

Average annual prices for 2000 are as follows:

Continental	$0.57 /bunch
English	$0.60 /bunch
All varieties	$0.58 / bunch.

5.9.2 Frozen Parsley

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

5.9.3 Dry Parsley

Estimated Annual Quantity
60 MT.

Approximate Market Price
$7.00 / kg

5.10 Rosemary

Rosmarinus officinali, R.prostratus

English	*sea dew, old man, compass weed, compass plant*
Greek:	*thendrolivano*
Turkish:	*biberiye*

Description

Rosemary is a hardy, sun-loving perennial shrub. here are two varieties; an upright plant that grows to 1.5 m tall, with a stiff, bushy appearance making it suitable for hedges, and a low-growing prostrate variety which is no higher than 30 cm. Prostrate rosemary ***R.prostratus*** grows particularly well in rockeries and on top of retaining walls, where it can spill down over the sides making an attractive, fragrant display. They both have similar woody stems, and leathery, needle-like leaves.

Each leaf is dark-green and glossy on top with a longitudinal crease down the middle. Its edges have the appearance of being neatly rolled-down. The leaf underside is dull, pale gray-green, and concave with a central rib underneath. The leaves of upright rosemary are about 30 mm long whereas prostrate rosemary leaves are almost half the size. The flowers of prostrate rosemary are also smaller and a delicate Wedgewood blue.

Rosemary leaves, when bruised, give off an aroma that is fragrant, pine-like, cooling, minty and refreshingly head-clearing with hints of eucalyptus. Their flavour is astringent, pine-like, peppery, warming, woody and herby, with a lingering camphor-like aftertaste. Upright rosemary is a little more pungent than prostrate, otherwise their sensory characteristics are the same. Although there are some other varieties of rosemary, one with white flowers, and another having gold-edged leaves, they are rarely seen or desired for culinary purposes. When dried, the rolled edges of rosemary leaves curl tightly in minute scrolls losing their flat appearance and becoming like hard, curved pine needles. These are often cut into 5mm lengths to make them easier to use. When dry the flavour remains pungent, woody and pine-like, but does lose some of the volatile, ‘green’ notes.

5.10.1 Fresh Rosemary

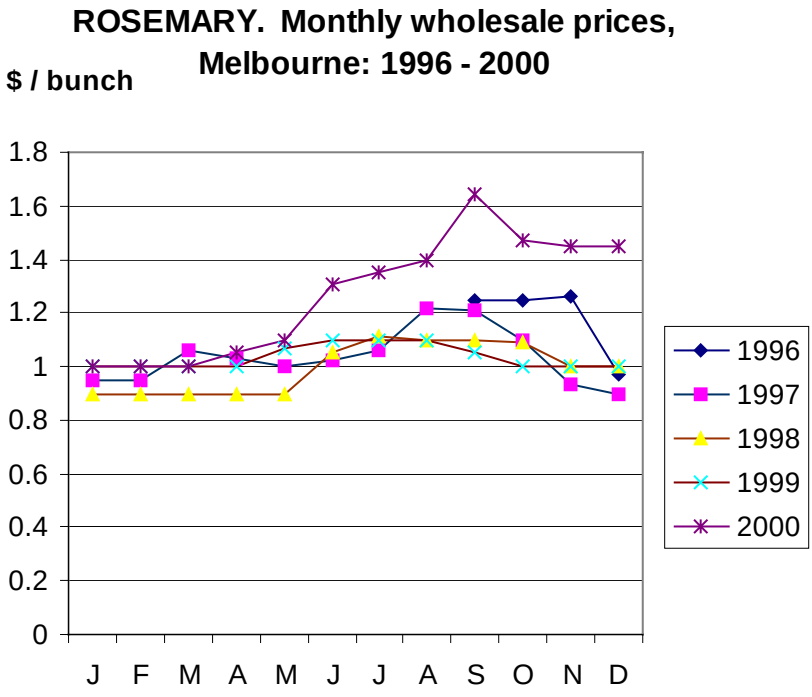
Estimated Annual Quantity

Unable to be established.

Approximate Market Price

$1.40 / kg

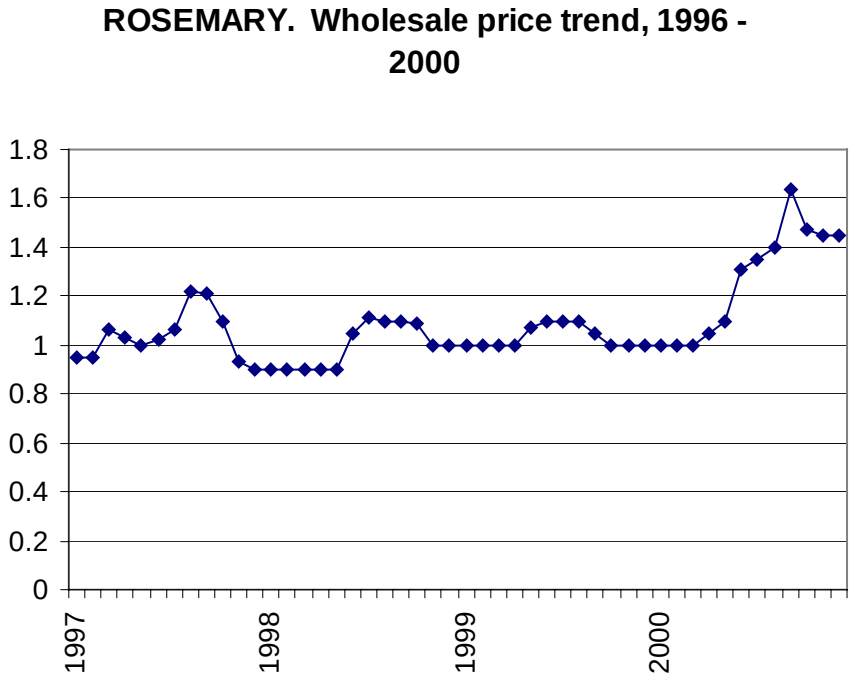
Fig. 11



Source: Ausmarket Consultants

The wholesale price trend for rosemary is upwards, see Fig.12.

Fig. 12



The preference for fresh rosemary comes from the fact that dehydrated rosemary is always hard and does not reconstitute readily, unless cooked or moistened for a long period of time.

Rosemary, being a perennial shrub, is usually readily available from the produce markets.

Frozen rosemary is not readily available.

5.10.2 Dry Rosemary

Estimated Annual Requirement
80 MT

Approximate Market Price
$3.20 / kg.

Because dehydrated rosemary does not soften easily in cooking, ground rosemary leaves are commonly used in food manufacturing. Rosemary retains its flavour strength effectively when dried and powdered making the need for a frozen alternative less attractive than for some herbs.

5.11 Sage

Salvia officinalis

English *Dalmatian sage* ***Salvia officinalis****, Blue sage* ***S.clevelandii****, Clary Sage* ***S. sclarea*** *Red sage* ***S.coccinea****, Golden chia* ***S. columbariae****, Peruvian sage* ***S. discolor****, Salvia / Salvia of the Gods* ***S. divinorum****, Fruit sage* ***S.dorisiana,*** *Pineapple sage* ***S.elegans****, Mealy sage* ***S.farinacea****, Greek sage* ***S.fruticosa,*** *Roseleaf sage* ***S.involucrata****, Spanish sage* ***S. lavandulifolia****, Garden sage* ***S.officinalis,*** *Apple sage* ***S.pomifera,*** *Bluebeard sage* ***S. viridis***

Description

Sage is a hardy, erect, perennial that grows to around 90 cm tall with wiry, green and purple-hued stems and a base that becomes woody over 2 or 3 years. Sage leaves are about 8cm long and 12mm wide, grey-green, rough yet downy and pebbly-textured on top. The underneath is deeply veined and filigreed like an opaque cicada's wing. As the leaves mature and harden their greenness turns to a soft, silvery grey. Long stems bear the purple, lipped flowers in autumn, a natural attraction to bees, which produce a much-valued sage honey in sage's native Dalmatia on the shores of the Adriatic Sea.

There are around 750 varieties of *Salvia*, however it is the garden sage ***S. officinalis*** that is of primary culinary importance. Clary sage ***S. sclarea*** is a sparser variety, little used these days, with foliage that is more rust-coloured and has bluish-white to white flowers. Purple leaf sage is grown more for decorative purposes, as is a red flowering variety. Another red-flowered sage is the aptly named pineapple sage and there is even a garlic sage with tall, yellow-white flower clusters and a rank, garlic aroma.

Sage has a high pungency level similar to that of rosemary and thyme with an aroma that is fresh, head clearing and balsamic. The flavour is herbaceous, savoury and astringent with hints of peppermint.

Dried sage leaves retain the characteristic aroma and flavour of fresh sage so well, they seem just like a concentrated version. These are most often seen as 'rubbed' leaves, which are light-grey in colour with a fluffy, springy texture.

5.11.1 Fresh Sage

Estimated Annual Quantity
Unable to be established.

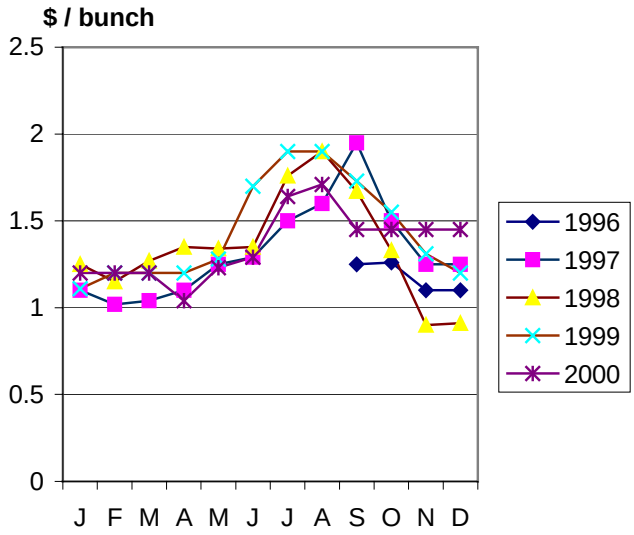
Approximate Market Price
$1.40 / bunch.

See Figure 13.

Although fresh sage is a perennial its availability tends to fluctuate in the fresh markets. There is a marked price rise in winter.

Fig. 13

SAGE. Monthly wholesale prices, Melbourne: 1996 - 2000

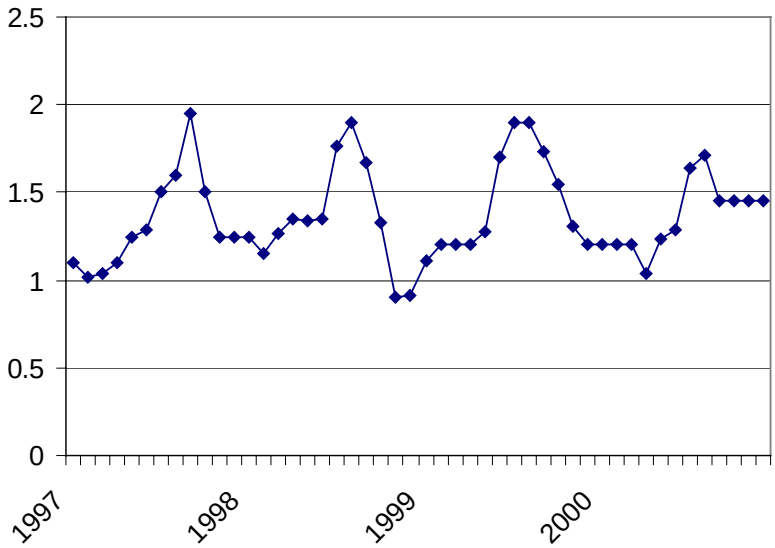


Source: Ausmarket Consultants

The price trend is basically static, see Fig. 14

Fig. 14

SAGE. Wholesale price trend, 1996 - 2000



Sage plants require replanting every two to three years and they are adversely effected by prolonged periods of heavy moisture and humidity.

5.11.2 Frozen Sage

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

Sage is available in IQF form and although could possibly be used by the food service industry, when fresh sage is in short supply, it does not appear to have become available to this market segment. Its use in manufacturing is not widespread because dried sage performs well in the majority of dishes that call for sage as an ingredient.

5.11.3 Dry Sage

Estimated Annual Quantity
60 MT

Approximate Market Price
$3.80 / kg.

Both rubbed and ground sage are used extensively in food manufacturing, especially for seasoned stuffing mixes and many savoury packet meals. The flavour of dried sage is perfectly acceptable in these situations. The issue of greatest concern to re-packers is the bulk index of rubbed sage and from time to time the presence of stem material. Ground sage poses no real problems for users.

5.12 Tarragon

Artenisia dracunculus

There are two types: "French" ***A.dracunculus*** var***. sativa,*** and "Russian" ***A.drancunculoides*** syn. ***A.drancunculus***, albeit both types originated in Russia. Winter Tarragon is ***Tagetes lucida***.

Description

French tarragon is a small herbaceous perennial with smooth, glossy, dark green, long narrow leaves shooting from opposite sides of wiry stalks that form a tangle of stems 90cm high. The small, yellowish buds rarely develop into flowers and it is said that even in the unusual circumstance of setting seed, they are often sterile. For this reason what is referred to as true tarragon can only be propagated by root division or the taking of cuttings. It must be grown in well-drained soil, protected from frost and positioned where it gets plenty of sunshine and only partial shade.

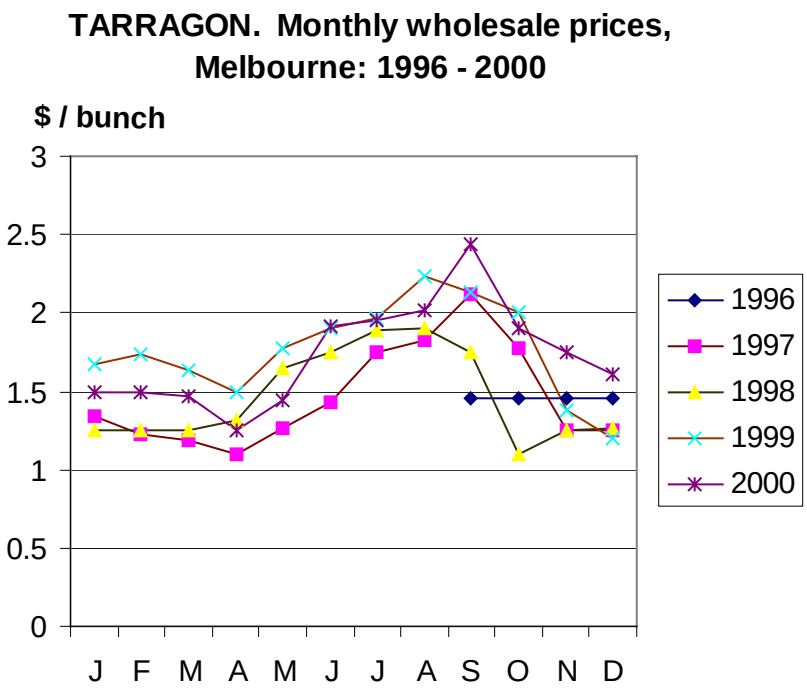
French tarragon is popular for its characteristic licorice-anise aroma and tart, lingering, appetite-appealing flavour. Russian tarragon has neither the pungency nor fragrance of French tarragon. In the field it is recognized by growing twice as tall with paler, larger, indented leaves and seed-bearing flowers. Winter tarragon bears bright yellow flowers, is sturdy and neat looking with firm, dark green leaves. It has a reasonably strong, spicy aroma similar to French tarragon. This grows from seed and is more often than not incorrectly sold to the unsuspecting as French tarragon.

5.12.1 Fresh Tarragon

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

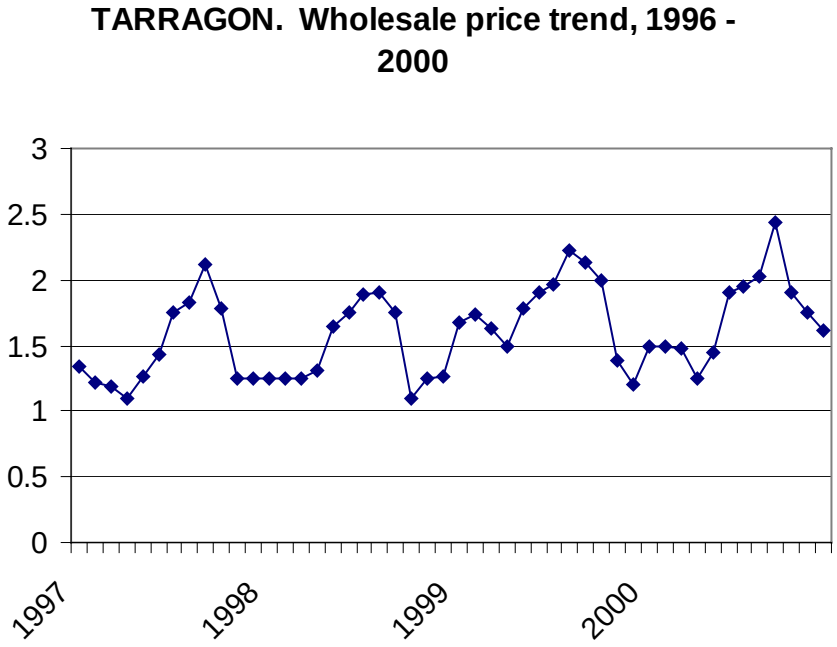
Fig 15.



Source: Ausmarket Consultants

Prices are trending upwards, see Fig. 16

Fig. 16



The confusion surrounding French tarragon is not limited to the household as many fresh produce merchants are selling Russian or winter tarragon as French.

This makes accurate market data hard to come by, so any figures quoted should be taken as representing all types referred to as *tarragon*.

Fresh tarragon is not consistently available, causing some consternation among food service/restaurant buyers. The annual high : low price volatility over the four year period for data are available varied between 62 – 92 percent. This was amongst the highest of all the culinary herbs studied.

5.12.2 Frozen Tarragon

IQF tarragon does not appear to be readily available, probably because it not used as a major ingredient in processed foods and there has not been a move to introduce IQF culinary herbs to the food service market.

5.12.3 Dry Tarragon

Estimated Annual Quantity
2.5 MT.

Approximate Market Price
$18.00 / kg.

Dehydrated French tarragon is imported from Germany and New Zealand. The greatest demand is for high quality, green cut leaf. There has been a significantly inferior dark green to almost black grade available that smells like tobacco and is not of much use.

5.13 Thyme

Thymus vulgaris

English — Common Thyme, Azores Thyme **T.caespititius**, Conehead Thyme **T.capitatus**, Caraway Thyme **T.herba-barona,** Creeping Thyme, Garden Thyme **T.vulgaris, T.praecox** Japanese Thyme **T.quinquecostatus**, Lavender Thyme **T.thracicus**, Lemon Thyme **T.×citriodorus**, Mastic Thyme **T.mastichina**, , Mother-of-Thyme, **T.serpyllum**, Spanish Thyme **T zygis,**Wooly Thyme **T.pseudolanuginosus**, Wild Thyme **T.pulegiodes/T.serpyllum,** Larger Wild Thyme:**T. pulegioide** Golden thyme **T.aureum**

Description

Although there are over 100 varieties of thyme, including many hybrids, it is really only common garden thyme ***Thymus vulgaris*** and lemon thyme ***T. citriodorus*** that are of culinary significance. Ornamental types that are rarely used in cooking include Westmoreland thyme, golden thyme, silver posy thyme, gray woolly thyme, variegated lemon thyme and caraway thyme.

Garden thyme is a small perennial shrub that may vary widely in appearance depending upon the soil and climatic conditions it is growing under. Generally this variety of thyme is stiff and bushy in appearance with many thin, erect, stalks no higher than 30cm, that are covered by pairs of small, narrow, elliptical gray-green leaves, sometimes reddish rust coloured on the underside, and from 5 to 10mm long. Pinkish-white, lipped flowers are particularly attractive to bees and are borne in whorls at the tips of the branches.

The aroma of thyme is pungent, warming, spicy and agreeable. Its flavour is similarly pungent and warming with a lingering, medicinal, mouth-freshening sharpness that comes from the presence of an important volatile oil, *thymol.* Lemon thyme is a cross between garden thyme ***T. vulgaris*** and the large wild thyme ***T. pulegioides*** and is a smaller plant of similar structure that only grows to 15cm tall. Its leaves are greener than those of garden thyme and although less pungent in flavour, have a particularly appealing lemon tang**.** ***T. serpyllum*** is arguably the best known of the low-growing, ground-cover thymes seen in abundance in rockeries and filling gaps in sandstone flagging.

5.13.1 Fresh Thyme

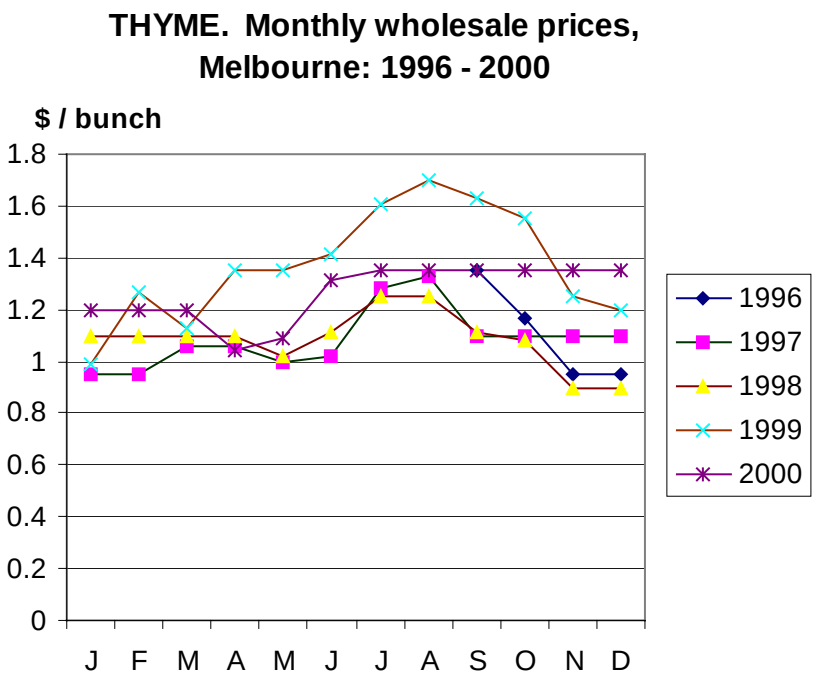
Estimated Annual Quantity

Unable to be established.

Approximate Market Price

Unable to be established.

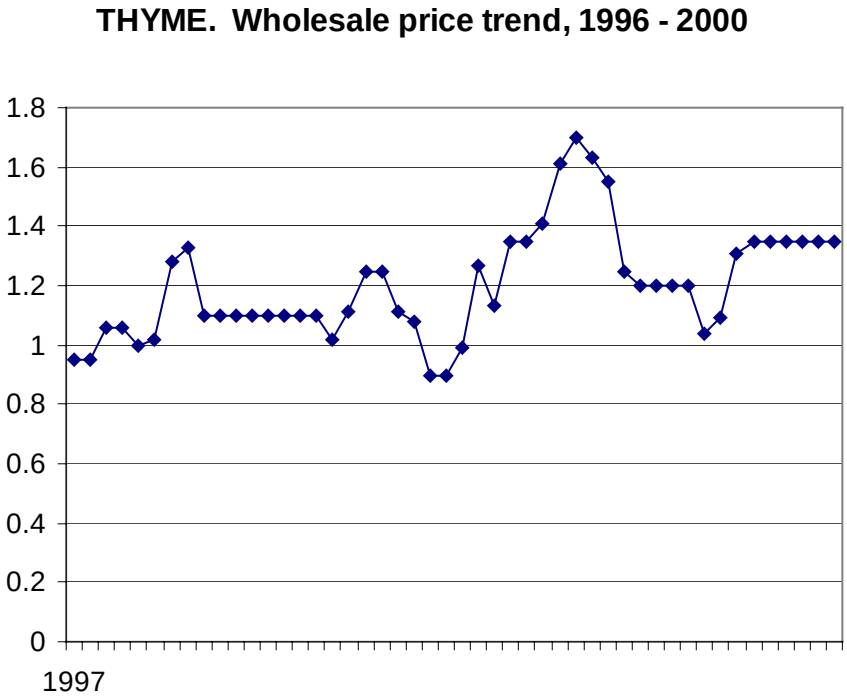
Fig. 17



Source: Ausmarket Consultants

Prices appear to be trending upwards, see Fig. 187

Fig. 18



5.13.1 Frozen Thyme

Estimated Annual Quantity
Unable to be established.

Approximate Market Price
Unable to be established.

5.13.2 Dry Thyme

Estimated Annual Quantity
110 MT.

Approximate Market Price
$3.00 / kg.

Dehydrated thyme is used in large volume for re-packing and is also a common ingredient in manufactured foods. It is used in both whole and ground forms. Due to the presence of pieces of stalk and the fact that some imported material is not well cleaned, ground thyme is often preferred.

5.14 Vietnamese Mint

Polygonum odoratum, Persicaria odorata

English *Leaf, Vietnamese Coriander, Asian Mint, Cambodian Mint, Hot Mint, Knotweed*

Description

This herbaceous perennial is not a member of the mint family at all but belongs to the same genus as sorrell ***Rumex spp***. which is a ***Polygonaceae***. Most commonly referred to as Vietnamese mint, it bears long pink or white flowers at the top of slender stems to 35cm high with swollen-looking joints 1-5cm apart. It is from these joints that its deep-green, tapering 5-8cm long leaves shoot out. cThe leaf colour may appear dark due to random black smudging in their pigmentation, which seems less pronounced in plants growing in the shade. cThe aroma is fragrant, minty, insect-like resembling coriander and reminds one of basil with an overtone of citrus zest. cThese attributes are apparent in the taste and are accompanied by a warming, biting, peppery sensation that is surprisingly hot.

5.14.1 Fresh Vietnamese Mint

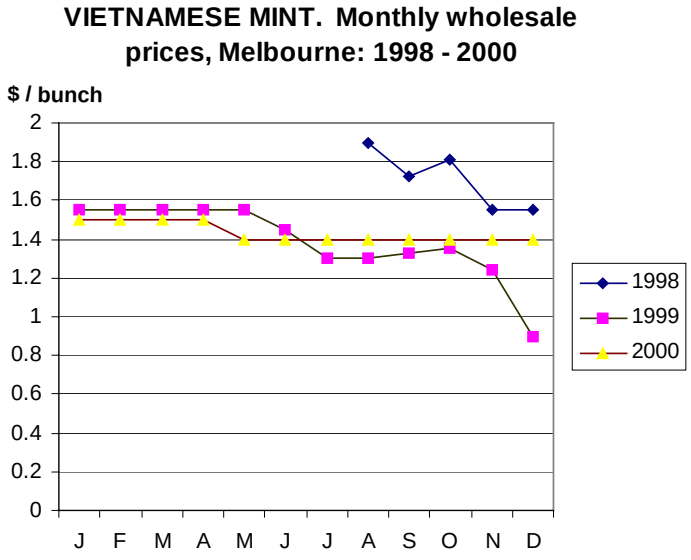
Estimated Annual Quantity

Unable to be established.

Approximate Market Price

$1.40 / bunch, see Fig. 19.

Fig. 19



Source: Ausmarket Consultants

Vietnamese mint has probably the most stable price behaviour of all the herbs. This suggests that supply is evenly spaced throughout the year.

6. Market perceptions

Interviewees were asked about their perceptions of Australian culinary herbs based upon the criteria outlined in 3.2 above. Because the majority of fresh herbs are locally grown, and buyers responses to individual fresh herbs have been noted, the following comments relate to dehydrated culinary herbs only.

6.1 Price

All buyers placed price close to the top of their hierarchy of requirements when buying herbs. They did however qualify this by stating that price is always relative to quality and what the market will bear. All buyers expected Australian grown material to be higher in cost than imported. However they did not necessarily state that they would be prepared to pay higher prices for locally grown herbs. Every buyer operates in a competitive environment, so they will always evaluate material on the basis of their ability to re-sell it.

6.2 Quality

On the supposedly subjective aspect of quality, buyers expected that Australian grown material would be higher in some attributes, but lower in others.

6.2.1 Physical Attributes

There was a perception that local material would be better in colour because it may be dehydrated using more technically advanced processes. Further, because it would be supplied closer to the harvesting season it is expected to deteriorate less in transport and storage. This reasoning carried through to overall appearance.

Consistency of bulk index was perceived as a bit of a worry. Bulk index standards have been established over a period of time and new producers are expected to take some time to really get the hang of how to establish a standard and then keep to it.

6.2.2 Chemical Standards

While there was an expectation that volatile oil levels would be good based upon the perceptions that relate to the physical attributes of material, there was some concern expressed about chemical and heavy metal residues. There is a clash between the image of Australia's clean unspoilt environment and high standards of produce and the reality. Some concern was expressed about the levels of chemicals that are still used in Australian agriculture, when compared to the low usage in many of the third world and developing countries imported herbs come from. Heavy metal residues were also mentioned as a cause for concern with Australian grown material, a by product of our environment coupled with the effects of high super phosphate use for many years.

6.2.3 Microbiological Standards

There was a perception that the microbiological standards of locally grown material should be high, negating the need for any form of sterilization.

Some comments were made that it seemed strange that dehydrated imported material was subjected to such rigorous testing while locally grown fresh produce appeared to be exempt from having to meet any microbiological criteria.

6.2.4 Organoleptic Attributes

There was a perception that these could be superior to imported material for the same reasons as outlined in 5.2.1 above. However it would remain to be seen as to whether a combination of cultivar selection and local climatic and soil conditions would be able to produce herbs of equivalent pungency as that being currently sourced from overseas.

6.3 General

An important factor for prospective suppliers of dehydrated herbs to consider is the market structure. Currently, all the major suppliers of culinary herbs import material through brokers, processors or grower's co-operatives in the countries of origin. Many importers are able to secure some form of exclusivity with the exporter, precluding competitors from gaining access to the same material at similar pricing. These importers may also deal with a number of exporters, so should there be a crop failure or other supply issue, the importer can get a similar grade from another supplier and still keep customers satisfied.

A perceived downside to dealing with local growers is that they will sell their material to all comers, so it is not worth putting in the time and effort to convince a customer to try local material. There is also a history of local growers by-passing the importer/distributor and selling direct to the importer's customer. This may appear to cut out a middle-man. However, should the grower not be able to sustain continuity of supply the buyer then has to evaluate imported material again and will probably not be prepared to go through the hassle of changing suppliers again. In these circumstances the buyer tends to go back to the importer for supplies that will be available on a consistent basis.

Some of the interviewees believed that it would just not be possible for local growers to process herbs competitively when one considers how many herbs are dried with free energy from the sun. Combine the low processing cost with established growing practices and the picture looks even more difficult.

7. Recommended Course of Action

Although many of the buyers of dehydrated herbs seemed somewhat negative about locally grown material, they all shared a sympathy and interest in local growers finding some way to become viable.

The view was that local material would have to offer some tangible benefit over imported produce and this could most likely be achieved through more sophisticated processing techniques that would produce a noticeably superior product.

More work on the production of essential oils of culinary herbs may lead to their greater use in processed foods, where the vagaries of flavour strength and microbiological stability of existing materials presently cause problems.

The notion of co-operatives that can produce enough material to smooth out the peaks and troughs of availability from just one farm, were also mentioned as a positive approach that could be taken to boost buyer confidence.