Exclusion diets may have a practical place in determining of precipitating dietary factors in certain clinical conditions. We present an exclusion diet which is based on the exclusion of food commonly known to cause food allergies, and the exclusion of food which contains salicylates, benzoates, tartrazine, yeast, and penicillin. This provided a basis for challenge with these additives and natural chemicals. Preliminary information in urticaria suggests a use for this diet in some allergic conditions.

Manipulation of diet to exclude certain additives and natural chemical substances has become popular in a variety of clinical situations. Although there is little scientific basis for the use of such an exclusion diet for many conditions, there is a belief that the removal of certain additives may be beneficial in some allergic disorders. As part of a study of the pathogenesis and management of chronic urticaria we have successfully modified patients' diets to exclude a group of chemicals which are thought to be precipitating factors.

Appropriate diets were not readily available, and much of the information which was available was not relevant to Australian conditions, was totally empirical, and hopelessly outdated. We thus constructed a diet relevant to Australian conditions which was based on the most sound analytical data available and which was as nutritious and palatable as possible. Many difficulties were encountered in developing this diet, such as a lack of information on the contents of commercial products. This article is in response to requests from medical practitioners who are unable to obtain a suitable exclusion diet which is relevant to the Australian eating pattern.

**Exclusion Diet**

The aim was to construct a diet which excluded food which caused symptoms (determined by taking a food history), food commonly known to cause food allergies¹ (for example, eggs, fish, seafoods, nuts, peas and beans), and food containing specific substances (salicylates,² benzoates, penicillin, yeast and tartrazine,³) while maintaining the best possible nutrition and patient acceptance.

**Basic Diet**

1. Meat: Lamb and chicken are used as sources of protein, fat, iron and vitamins. Reported cases of beef-induced urticaria lead to its exclusion.
2. Vegetables: Carrots, lettuce and parsley are free from natural benzoates and salicylates, but contain fibre, water, some vitamins and some minerals. Parsley adds taste and appeal to meals and contains vitamin C. Carrots are a good source of carotene (provitamin A).

3. Fruit: Fresh pears do not contain benzoates or salicylates. They are preserved in cans in a sugar-and-water syrup.

4. Cereals: Matzo, an unleavened crispbread which consists of semolina and water, can be used as a bread substitute (it is used by Jewish people during Passover and is available at most large stores and delicatessens). Semolina is a fine porridge made from hard wheat. Plain wholemeal flour and white flour can be used in batters, thickening and so on. Rice is a suitable potato substitute. Rice bubbles and rice noodles are permitted commercial products which are free from additives. In rice bubbles, the iron and vitamin B content has been restored after processing.

5. Fats: Sunflower, safflower and olive oils are suitable. Avoid butter because it is possible a source of penicillin, and margarine because of the addition of flavouring essences.

6. Miscellaneous: Salt and pepper are the only condiments which are used in the Australian dairy industry and, as these substances are secreted into the milk, milk and milk products were excluded.

**Absolute Additional Exclusion**

All aspirin containing medications (for example, Disprin, Alka-seltzer, or compound analgesics) are prohibited. Similarly excluded are those medications which contain yellow colouring (tartrazine), for example, orange or red tablets. Most flavourings contain salicylates and are found in toothpaste, cough lozenges, flavoured medications and syrups. Oil of wintergreen, a concentrated source of salicylates, is found in creams for muscle soreness (for example, Dencorub, Deep Heat). Perfumes are used to scent all toiletries and contain salicylates and benzoes. Their use often causes skin irritations.

**Medications Which are Allowed**

Use white, pink or blue antihistamine tablets (that is, avoid yellow and green tablets because of tartrazine in the colouring). For example, orange or red tablets. Most flavourings contain salicylates and are found in toothpaste, cough lozenges, flavoured medications and syrups. Oil of wintergreen, a concentrated source of salicylates, is found in creams for muscle soreness (for example, Dencorub, Deep Heat). Perfumes are used to scent all toiletries and contain salicylates and benzoes. Their use often causes skin irritations.

**Specific Chemical Factors**

Salicylates are present in aspirin, oil of wintergreen and many compound analgesics. They occur naturally in foods, for example, in many fruits and vegetables. Sodium benzoate and 4-hydroxybenzoic acid are preservatives which are used regularly in foods and found as natural constituents of foods. Tartrazine is an approved yellow dye and food colour. Penicillin, which is used by the dairy industry to control infection in herds, is secreted in milk. This has led to the prohibition from this diet of all milk and dairy produce. Yeast is present as a leavening agent in all breads, some baked goods and spreads. Challenge doses used in this study were as follows:

- **lactose** (placebo) 10 mg
- **tartrazine** 10 mg
- **sodium benzoate** 500 mg
- **4-hydroxybenzoic acid** 200 mg
- **brewers yeast** 0 g
- **penicillin** 250 mg
- **aspirin** 150 mg
- **aspirin** 300 mg

**DISCUSSION**

In the past, elimination diets have been used in a number of clinical situations with little rationale. Renewed interest in elimination diets follows apparent clinical benefit in a number of conditions, which probably include very different pathogenic mechanisms. Our own interest developed as part of a study of chronic urticaria, but, when no appropriate diet could be obtained, we developed one applicable to Australian conditions. A number of problems were met.

First, available diets were largely empirical. Our initial aim was to compound a diet which was low in salicylates, benzoates and tartrazine. Tartrazine, a yellow dye which is used widely as a colouring principle, has been implicated by other workers as a cause of chronic urticaria. We have not found this substance to be significant. However, information as to the presence and amount of salicylates and benzoates which occur naturally in food is incomplete, scattered, unorganized and sometimes contradictory. Thus, while the current diet is largely empirical, an effort has been made to exclude foods generally considered to contain these chemicals.

Second, it was difficult to compile a list of commercial products containing salicylates, benzoates, and tartrazine, because of varying production methods of similar foods, poor labelling, lack of knowledge, and varying national standards (for example, the use of preservatives in cheese and coffee in the United States, but not in Australia). Investigation of many commercial products showed that they included added herbs and spices, both of which contain salicylates and benzoates.

It is emphasized that the primary exclusion diet is used for a total of four weeks, and is intended only to identify (i) patients with symptoms which are precipitated by certain chemical factors, and (ii) specific precipitants of the clinical condition, by way of challenge during the second two weeks of the diet. Although several overweight patients have lost weight, the exclusion diet avoids the substances which cause exacerbations under the test conditions. Ressessment at one month, three months and six months enables minor diet modifications when needed. Objective criteria are used; for example, in urticaria, the levels of immune complexes are used to follow the response.

**Specific Chemical Factors**

Salicylates are present in aspirin, oil of wintergreen and many compound analogues. They occur naturally in foods, for example, in many fruits and vegetables. Sodium benzoate and 4-hydroxybenzoic acid are preservatives which are used regularly in foods and found as natural constituents of foods. Tartrazine is an approved yellow dye and food colour. Penicillin, which is used by the dairy industry to control infection in herds, is secreted in milk. This has led to the prohibition from this diet of all milk and dairy produce. Yeast is present as a leavening agent in all breads, some baked goods and spreads. Challenge doses used in this study were as follows:

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- **aspirin** 150 mg
- **aspirin** 300 mg

**Recipes are available on request from the Dietitian's Office, Royal Prince Alfred Hospital.**
exacerbations occurred in several patients who took large amounts. Similarly, white spaghetti had to be excluded when manufacturers added tartrazine to increase "appeal".

To illustrate the potential value of this diet, we summarize our results in 15 patients with chronic urticaria who have adhered to the diet. Fourteen patients have had remission or marked improvement, and all of these have had a positive response to one or more of the challenges. Eight patients have reacted to salicylate, four to benzoates, and two to penicillin. Follow up of the 14 patients taking a diet modified by the above tests has shown continuing partial remission or complete remission.

It is emphasized that the exclusion diet must be restricted to the evaluation of the role of certain additives and food factors in precipitating clinical conditions (for example, allergic disease, urticaria, hyperactivity and so on) and that carefully supervised controlled trials are needed to establish the place of modified exclusion diets in the management of these conditions. In addition, a more scientific approach to the construction of an exclusion diet is needed, such as a chemical analysis of foods to compile a list which contains the amount of natural salicylates and benzoates in foods, and the education of commercial food companies to determine and make known the nature of additives to their products.

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REFERENCES


APPENDIX

Exclusion Diet

Foods allowed

Meat: Lamb, chicken
Vegetables: Lettuce, carrots, parsley

Details of the current situation with regard to low salicylate-benzoate diets may be obtained from the Department of Dietetics, Royal Prince Alfred Hospital.

Fruits:

Pears (fresh and canned)

Cereals:

Matzo (biscuits), plain flour, semolina, rice, rice noodles, rice bubbles

Fats:

Oils (for example, olive, safflower, peanut)

Sugars:

Sugar, golden syrup, honey

Miscellaneous:

Malt vinegar, salt, pepper, gelatine

Beverages:

Coffee (instant and ground)

Soups:

Home-made soups using above ingredients

Desserts:

Home-made desserts using above ingredients

Foods not allowed

You must not have any foods or drinks not listed above, that is, no milk, cheese, tea, soft drinks, lollies, chewing gum, butter, margarine, bread, beef, pork or bacon.

Drugs and miscellaneous items to be avoided

1. All medications not prescribed by your doctor, for example, aspirin, Disprin, Alka-seltzer.
2. All medications containing flavouring and colourings.
3. Oil of wintergreen, for example, Dencorub, Deep Heat.
4. Toothpaste is not to be used. Note: A mixture of salt and soda may be used as a substitute or a preparation produced by your chemist or just ordinary salt.
5. Perfumes, for examples, deodorant, soap powder, talcum powder, hair shampoo, make-up and so on. (Unscented, uncoloured Neutrogena or Sunlight laundry soap may be used. Unscented talcum powder may be purchased from some chemists. Clear baby oil may be used.)
6. Cough lozenges and syrup.

Medications which may be used

1. Antihistamines, but only when necessary.
2. White codeine tablets.

Diets Rules

1. Use the food list. Do not use any foods not listed.
2. Do not use any medications not listed.
3. This diet is to be followed for an initial 14 days, after which time you will be challenged with various compounds and foods containing these compounds.

It is important to keep a dairy recording the foods eaten throughout the day. This should be in detail on the forms provided. In the second column, symptoms should be recorded with duration and doses of antihistamines taken.

When the test period is completed, your doctor and dietitian will assess your progress and ascertain the addition of challenge compounds into the basic diet. The challenge compounds should be added one at a time every second day.

If no symptoms occur with a challenge, then continue with the next. But if you do get symptoms wait until they subside, then take the next challenge compound. Take some antihistamine only when necessary. Throughout this period you should continue to follow the diet, keeping a daily record of foods eaten and reaction manifested.