One of the unusual flavours found in medieval Mongolian cooking is apricot kernel. This paper is a summary of my research into this seed, its safety for consumption, and feasible alternatives for safety.

**Uses**

Apricot kernel is the seed of *Punus mume* (although many commercially available apricot kernels are *Punus armeniaca*) located within the apricot pit. During the middle ages, in China and Mongolia, apricot kernel was used as a flavour similar to other spices. It falls within the bitter palate. Use of apricot kernel to make flour or as a finger food is not supported in this region during the middle ages.

In modern times, apricot kernels are used as a flavour additive, a snack food (primarily sweet apricot kernels are used for this rather than the bitter variety), and as a cancer therapy. It is important to note that there is no scientifically supported therapeutic use for apricot kernels in relation to cancer

**Apricot Kernels and Cyanide Poisoning**

Apricot kernels contain a varying level of a plant based toxin that can release hydrocyanic acid (HCN) within the human digestive tract. High levels of HCN in the gut can cause cyanide poisoning. This has led to the death of several people overseas. The first reported apricot kernel cyanide poisoning case was recorded in Turnkey in 1957. This case involved nine children – two of whom died as a direct result of apricot kernel ingestion. There have been two reported cases of apricot kernel induced cyanide poisoning in Australia that led to the initiation of a safety review by Food Standards Australia New Zealand (FSANZ).

The lethal dose of HCN for humans is reported to be as low as 1.5 mg/kg of body weight. Due to the identified dietary risks of eating raw apricot kernels and the likelihood that any dosage recommendations would be ignored, FSANZ enacted a total sale ban on raw apricot kernels within Australia and New Zealand in 2015. FSANZ also released an updated ‘safe dosage’ for apricot kernels (currently listed as: Adults – 4 kernels or few per day; Children – there is no safe number recommended).

One argument given by those who would like to continue to have access to apricot kernels is that a 1.5mg/kg of body weight dosage would be difficult to obtain by ‘just a few kernels in one or two food dishes’. This is a true statement. However, the HCN in the body can build up over time (such as with...
people who are using apricot kernel as a drug, taking a larger number over many days) as the liver and kidneys cannot detox the body of the toxin quickly enough.

**Symptoms of cyanide poisoning may include:**

Weakness, vertigo, confusion, headaches, and rapid or difficult breathing. Loss of consciousness is often next if exposure continues, followed by coma, pulmonary edema, cardiac arrest, and death. Seizures, giddiness, and temporary cession of breathing have also been reported in cyanide poisoning cases though these seem to be more closely linked with inhalant dosages of cyanide.\(^5,6\)

Long term, low dose exposure to HCN include liver and kidney damage, permanent paralysis, hypothyroidism, and miscarriages.\(^7\)

The recognised treatment for cyanide poisoning is hospitalisation.

**Why is this a problem today but was not an issue back in the middle ages?**

Opinions vary as to why the first reported cyanide poisoning case was in the 1950s and not before. There is the possibility that cyanide poisoning after raw apricot kernel ingestion was not identified or associated with cause and effect. This is the most common belief. There is also the consideration that raw apricot kernel was not routinely eaten in China/Mongolia during the middle ages. The more common use of the kernel was as a cooked food additive. When heated, apricot kernel toxin levels lower.

Other researchers believe that the likely reason for the increase in reported poisoning outcomes is related to increased toxicity of the kernels themselves. These researchers believe that this increase in the toxin levels of the kernels must be related to the climate and stress levels of cultivated apricot species. As stress factors (heat, drought, nutrient levels) increase, the individual HNC level of apricot kernels from these plants also increase. These researchers believe that the middle ages were a more hospitable time for the trees. There is also the possibility that we have cultivated apricot trees that produce higher toxin levels naturally.\(^8\)

**Do we really need this flavour profile in our dishes?**

Ultimately, the answer to this question must be ‘no’. The toxic level of raw apricot kernel is such that we cannot reliably say that we would not cause harm by serving it (even if we cook the kernel, we do not have the equipment required for ensuring dietary safety). Though cooking and serving an apricot kernel containing medieval Mongolian redaction is unlikely to cause any large dosage cyanide poisoning at an event, we do not know if the people we are serving would suffer from low dosages of HNC.

**Alternatives**

The apricot kernel flavour palate (bitter) is required to properly balance the Mongolian flavours. Apricot kernels were banned for sale in Australia and New Zealand in 2015. Because of this, I decided that I needed to provide a viable alternative for redactions of Mongolian dishes I submit for tasting, feasts, and to cooks throughout the Kingdom.

Raw apricot kernel has a slightly oily, chalky texture and a mild, nutty flavour that has a fruity wash on the back of the tongue. Once heated, the texture is more like a soft nut-paste and still maintains the fruity back note; however, the initial taste is bitter (not sour).
My Research

I set out to find a nut that would be in keeping of the flavour balance of medieval Mongolia dishes that could be used as an apricot kernel substitute. I have selected the following nut products because the nuts were all available and used during the Yuan Dynasty in Mongolia.

- Acorns, *Castanopsis sclerophylla*, *Quercus* spp., esp: *Q. myrsinaefolia*
- Almonds/Badam Nut, *Prunus amygdalus*
- Hazelnut, *Corylus heterophylla*
- Hazelnut, *Corylus heterophylla*
- Ginkgo Nut, *Ginkgo biloba*
- Walnuts, *Juglans regia*
<table>
<thead>
<tr>
<th>Nut</th>
<th>Scientific Name</th>
<th>Flavour/Smell</th>
<th>Texture</th>
<th>How close to raw apricot kernel</th>
<th>Cooked flavour/texture</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acorns</td>
<td>Castanopsis sclerophylla, Quercus spp., esp: Q. myrsinaefolia</td>
<td>Potato-like, fairly bland with a bitter aftertaste</td>
<td>Pastey with a drying feel in the mouth</td>
<td>Fairly close</td>
<td>Nut paste or bread</td>
<td>Raw acorns are toxic in large doses. To reduce the toxins, there is an involved process of washing and grinding. Given the difficulty in finding food grade acorns and the possible toxin issue, I decided to remove acorns from the possibility list.</td>
</tr>
<tr>
<td>Almonds/Badam Nut</td>
<td>Prunus amygdalus</td>
<td>Sweet, bland, and a known flavour of its own</td>
<td>Oily and soft</td>
<td>Not very close</td>
<td>Nut paste or bread</td>
<td>Almond flavour is quite unique and familiar to most people, so it is not ideal for a global product, but it is a good option in some regions.</td>
</tr>
<tr>
<td>Apricot Kernel Paste</td>
<td>Prunus mume or Prunus armeniaca</td>
<td>You can purchase apricot kernel paste pre-made, often called Prisipan. This product is still available in specialty cake shops and has been found to be within tolerable levels of dietary safety by FSANZ. If using this product, the recipe needs to be adjusted to most food guidelines. This product is still available in specialty cake shops and has been found to be within tolerable levels of dietary safety by FSANZ.</td>
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<tr>
<td>Ginkgo Nut</td>
<td>Ginkgo biloba</td>
<td>Bitter with a distinctive cheesy taste</td>
<td>Creamy</td>
<td>Not very close</td>
<td>Nut paste or bread</td>
<td>Ginkgo nuts are difficult to find in some areas.</td>
</tr>
<tr>
<td>Hazelnut</td>
<td>Corylus heterophylla</td>
<td>A fairly bland, nut flavour with a sweet aftertaste</td>
<td>Slightly crunchy</td>
<td>Very close</td>
<td>Nut paste or bread</td>
<td>Hazelnuts are easily accessible and familiar.</td>
</tr>
<tr>
<td>Pine Nut</td>
<td>Pinus ssp.</td>
<td>Bland flavour, very slightly bitter</td>
<td>Soft and oily in a creamy</td>
<td>Slightly better</td>
<td>Nut paste or bread</td>
<td>Pine nuts are available in most shops. However, they lack the nutty sweetness associated with pine nuts. Pine nuts are not ideal for global applications, as they are also available in some areas.</td>
</tr>
<tr>
<td>Walnuts</td>
<td>Juglans regia</td>
<td>Bitter, woody</td>
<td>Woody</td>
<td>Very close</td>
<td>Nut paste or bread</td>
<td>Walnuts are difficult to find in some areas.</td>
</tr>
</tbody>
</table>
My Preferred Substitutes for Apricot Kernel

To my palate, pine nuts offer an adequate substitute to apricot kernels in most cases. In those dishes where a more bitter nut is required to balance flavours (such as in a dish with a strong flavoured red meat), walnut could be used. To compensate for the fruit after taste, I include a sweet fruit juice such as apricot or peach. I have found that the following substitution works well:

For each 1 teaspoon Apricot Kernel, substitute 1 teaspoon Pine Nut and ½ teaspoon Apricot Juice

Or

For each 1 teaspoon Apricot Kernel, substitute ½ teaspoon Walnut and ½ teaspoon Apricot Juice

Conclusion

Because apricot kernels are no longer attainable in Australia and New Zealand, due to the unpredictable dietary safety of the kernel, and my interest in achieving a similar balance to redacted Mongolian dishes, I offer the above practical advice to assist others wishing to recreate these fascinating dishes.

Notes


Additional Resources Used


