

## A REVIEW ON ROLE OF SAMSKARA (SPECIAL PROCESSING) IN FOOD AND PHARMACEUTICAL PREPARATIONS

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### ABSTRACT

All living beings depend upon the food for their life. Methods of cooking are the gradual developments which have taken place with the invention of fire and along with the time newer methods have been included. The similar methods are practiced in pharmaceutical preparations also with slight modifications. *Acharyas* of *Ayurveda* named these methods as *Samskaras* i.e. method of processing, which brings about transformation in the physical as well as the natural qualities within the *Dravya* (substance). Various *Samskaras* enumerated by *Acharyas* and their aims with their role in the food and pharmaceutical preparations are reviewed and compared with the present day processing methods in detail in the article.

**Keywords:** *Samskara*, *Ayurveda*, *Dravya*, Pharmaceutical, Processing

### INTRODUCTION

*Aahara* and *Aushadha* are the most important tools as far as the maintenance and restoring of health is concerned. *Aahara* play an equally important role in fulfilling the aims of *Ayurveda* i.e. *Swaasthyarakashana* (Preventive aspect) and *Vikaara Prashamana* (Curative aspect) where as the *Aushadha* deals with the balancing of deranged *Doshas* and restoring *Swaasthya*.<sup>1</sup> Food is the basic need of every living being. It can be consumed in raw form and cooked form. Cooking is a type of processing the food in order to make it both eatable and digestible. Cooking is also helps in making food palatable. Raw foods get spoilt because of the harmful micro-organism present in them. The benefits of cooking can be listed as follows: Cooking makes food easy to digest, improves the appearance, texture, color, fla-

vor, and taste of the food, cooked foods provide variety in our meals, cooking helps to keep the food preparation for longer time and cooking makes the food safe and sterile. *Acharya Vagbhatta* has defined an ideal *Aushadha*<sup>2</sup> as:

- *Bahu kalpam* (one which can be formulated into various dosage forms)
- *Bahu Gunam* (with multiple qualities)
- *Sampannam* (Rich with therapeutic values)
- *Yogyam* (Suitable to be included in a *Yoga* or combination).

The state of health can be maintained or regained only if both *Aahara* and *Aushadha* are prepared in a proper way. *Ayurveda* has explained various food preparations and a large number of medicinal formulations along with their method of preparation to achieve the goal. *Aushadha* and

Aahara jointly play important role in the management of patients as *Pathya* (suitable diet) is to be provided along with proper drug administration.

**Samskara**

According to *Acharya Charaka* the word ‘*Aahara Samskara*’ refers to the processing which causes transformation in a substance during which there takes place the contribution of *Gunas* and elimination of *Doshas*. The *Samskara* causes transformation in *Swabhavika Gunas* (natural attributes). *Samskara* refers to the process of transformation in the natural qualities of a food substance by the treatment through water, application of heat and other factors like washing/cleaning, churning, place of storage, time factor, flavoring, form of recipes or Levigation and the utensils used (with modifications like coating the inner surface by various medicinal herbs). *Samskaras* explained by *Charaka* are as follows.<sup>3</sup>

1. *Toya-Agni Sannikarsha* (water & fire)
2. *Shoucha* (Cleaning/ washing)
3. *Manthana* (Churning)
4. *Desha* (Place of storage)
5. *Kala* (Specific time/ Season)

6. *Bhaajana* (Vessels/Utensils)
7. *Kaala Prakarsha* (Time factor)
8. *Vaasana Samskara* (Flavoring)
9. *Bhavana Samskara* (Levigation)

The above description about *Samskara* actually refers to the *Aahara Samskara* (food processing) but commentators have described the same quote with the examples referring to pharmaceutical preparations. Hence it is understood that the same procedures of *Samskara* can be adopted in the preparations of medicines also.

The *Toya-Agni Sannikarsha* is taken as the single entity by the commentators while it can be considered as three separate entities as there are some methods where water or fire is used alone in the processing like application of dry heat, soaking etc. The modern methods of cooking is grossly comes either *Agni Sannikarsha* or *Toya-Agni Sannikarsha* combindly. The comparison between present cooking methods with that of *Ayurvedic* classical considerations are in Table 1.

Table 1: Comparing Ancient & Modern Methods of Cooking

Sl.No.	Modern Modes of Processing	Methods	Classical Methods
(A)	By moist heat	Boiling	<i>Toya-Agni Samskara (Kwathana)</i>
1		Simmering or stewing	<i>Toya-Agni Samskaara Over Manda Agni</i>
2		Steaming	<i>Swedana</i>
3		Pressure Cooking	
(B)	By dry heat	Baking	<i>Agni Sannikarsha</i>
1		Roasting	
2		Grilling	
(C)	By frying in ghee or oil	Shallow frying	<i>Agni Sannikarsha</i> <i>Bharjana Samskara</i>
1		Deep frying	<i>Taila/Ghrita Paaka or Talana</i>
2			

There is a general rule in *Ayurveda* that the *Gunas* (properties) as described by the *Acharyas* as existing in the inseparable

cause (*Kaarana*) are to be known as present in the effect (*Kaarya*) also. it is further quoted that sometimes a change in property

can result from the manner in which something is processed. A new property may also result from mixing of ingredients (*Samyoga*)<sup>4</sup> but this is not included in *Samskara*. *Samskara* can change the properties of food and medicine. We can increase useful properties and decrease harmful properties of food and medicines through *Samskara*. *Samskara* can be done through following methods:

### 1. *Toya Sannikarsha* (water treatment)

These are the methods by which *Samskara* can be done using water alone. Here the drug or the food substance is kept either for a shorter period (few hours) or for a longer period (overnight or few days). *Hima Kalpana* & *Paanaka Kalpana* is the classical examples for *Toya Sannikarsha*. *Toya Sannikarsha* includes Soaking, Steeping etc.

**(A) Soaking**<sup>5</sup>: Soaking pulses overnight in plenty of water & changing the water once helps to remove gas forming sugars. Raffinose, Stachyose and Pentosans are sugars found in pulses which are not digested in the small intestine. They provide a substrate for microbial fermentation in the lower part of gut and cause flatulence. Soaking also softens the seed, reduces cooking time and saves fuel. Seed coat of pulses contains tannins. Tannins interfere with digestion and causes obstruction. Soaking pulses in water for few hours removes excess tannins.

**E.g. Germination**: Pulses are germinated by soaking the seeds in water for at least 24-72 hours. Larger sprouts are achieved when seeds are soaked for 7-10 days. The water enters the seed and activates different enzymes which bring about biochemical changes. Germination improves the nutritional quality and digestibility of pulses.

- Phytic acid and Phytate are degraded, making minerals such as zinc, calcium, phosphorus and magnesium (which are bound to Phytate) available for absorption into the body.
- Germination causes degradation of anti nutrients like Trypsin inhibitor and Tannins.
- Protein degradation makes the protein in pulses more digestible.
- The fat content decreases by 17-60 %, while the fiber content increases by 50%.
- Vitamin C and riboflavin content increases substantially in germinating seeds.

Studies carried out based on the Ayurvedic concepts suggest that, Sprouts is good for *Kapha Prakriti*. For *Vaatik* & *Paittik Prakriti*, steamed sprouts should be given.<sup>6</sup>

**(B) Steeping**: Steeping Taro tubers (*Colocasia antiquorum* Schott; known as Arbi in Hindi) in cold water overnight, reduces toxins like calcium oxalate crystals which are one of the causes for renal calculi.

### 2. *Agni Sannikarsha* (fire treatment)

Contact of Agni (fire) gives lightness. Cooking makes the food sterile and safe for eating by killing germs. E.g.

- Wheat is heavy to digest but when we prepare dough with water then it becomes lighter. After this we prepare Chapati with contact of fire from this dough then it becomes even lighter.
- Milk often contains bacteria that cause tuberculosis. On boiling, the bacteria get killed and milk becomes safe for drinking.
- *Agnisannikarsha* (applying Heat alone) is used in the preparations like *Taandooram* (now known as *Tanduri*) and *Poopalika* (Paapad) where *Angaara* (burning charcoal) is used to cook the food and makes it lighter.<sup>7</sup>

- *Putapaaka vidhi* is explained for both food and pharmaceutical preparations. e.g. Cooking different types of meat (*Maamsa*) by means of *Phala putapaaka*<sup>8</sup>, *Vaasa putapaaka swarasa*<sup>9</sup> etc.

- *Agni Sannikarsha* to water i.e. *Kwathana* (Boiling) is one of the water purification measures described in *Sushruta Samhita*.<sup>10</sup> The *Ushna Jala* attains the properties of *Vata-Kaphaghna*, *Deepana- Paachana*, *Sroto-vishodhana* etc. which is quite opposite to that of *Sheetala jala* (Normal/cold water) which is *Dosha Sanghaata Vardhaka* (increases the consolidation of *Doshas*) in nature.<sup>11</sup> Thus processing by *Agni Sannikarsha* gives *Ushnodaka* a medicinal status.

### 3. *Toya-Agni Sannikarsha* (water & fire Treatment)

- Rice is heavy to digest, but when boiled, becomes lighter.
- Tamarind fruit (*Tamarindus indicus* Linn.) is of *Amla rasa* (sour taste), *Amla Vipaka* (principle that indicates the pharmacological behavior of a substance expressed after the digestion & metabolism) & increases *Pitta*.<sup>12</sup> But after boiling it attains *Madhura*, *Amla rasa*, *Madhura Vipaka* and pacifies *Pitta*.

### 4. *Shoucha* (Washing/ Cleaning)

It removes the physical impurities present in the raw material irrespective to whether it is a food substance, a medicinal herb or a mineral. The *Shoucha* can be considered as one of the *Shodhana* procedure like *Swedana*, *Mardana* etc.

E.g. addition of *Kataka Phala* (*Stychnos potatorum* Linn.) is advised after the completion of fermentation (one month later) in case of *Dashamoolaarishtha*<sup>13</sup> for the purpose of *Nirmaleekarana* as *Kataka Phala* helps in sedimentation and settles the heavy

ingredients and makes the *Arishta* clear, so that the filtration becomes easier. This also separates the *Kinva* and thus prevents re-fermentation after filtration. Hence this procedure also can be considered under *Shoucha Samskara* as it causes *Shuddhi*.

### 5. *Manthana* (Churning)

Yoghurt is heavy to digest, hot, *Abhisayandi* (it closes the pores & obstruct sweat & other channels of the body) & increase *Kapha*.<sup>14</sup> When we stir on adding water & remove butter then it becomes buttermilk which is lighter to digest, non-obstructive and reduces *Kapha*.<sup>15</sup>

### 6. *Desha* (Place)

*Desha* is the entity which brings about some of the transformation in medicinal preparation on keeping it in a particular place for a period of time. This is seen in the preparation of *Rasayanas* like *Braahma Rasayana* which is kept underground below the heap of ash.<sup>16</sup> Many of such special places like *Ashwa shaala*, *Dhannya raashi* etc have been indicated in the classics. The intention behind *Desha Samskara* is to maintain an optimum temperature for the prepared formulation to achieve it's *Samyak lakshanas* (optimum intended quality/features).

- Though the *Antariksha Jala* (rain water) is devoid of any *Rasa* and *Guna*, it is according to the nature (*Guna*) of the ground on which it falls will decide its properties. Hence the *Jala* (water) attains the *Guna* according to the *Bhoomi Desha* where it is flowing or gets stored.<sup>17</sup>

- Most of the *Ayurvedic* classics stress upon the source of water to be used according to season. This is an example for both *Desha* and *Kaala* type of *Samskara* which takes place naturally without any interven-

tion. Table 2 gives the details of season and particular water resources to be opted as per *Bhavaprakasha* which furnishes the collec-

tive opinion from all the ancient texts of *Ayurveda*.<sup>18</sup>

Table 2: Specific Season and particular water resources

Season (Kaala)	Source of water (Desha)
<i>Shishira ritu</i> (Winter season)	Reservoirs and ponds
<i>Vasanta ritu</i> (Spring season)	Well water and waterfalls
<i>Greeshma ritu</i> (summer season)	Well water and waterfalls
<i>Varsha ritu</i> (Rainy season)	Directly collected rain water and from fountains
<i>Sharat ritu</i> (Post-rainy season)	Water from all sources and specially <i>Hamsodaka</i> ( <i>Amshoodaka</i> )
<i>Hemanta ritu</i> (Autumn season)	Reservoirs and ponds

### 7. Kaala (Season/Time factor)

The *Kaala* refers to the season or any fraction of the time when the *Dravya* should be collected or the pharmaceutical preparations are to be made. E.g.

- *Pushyaanuga churna* is prepared by collecting the drugs on the day of *Pushya Nakshatra* (the day which is predominated by the Star *Pushya* acc. to Hindu calendar).<sup>19</sup>
- *Swarna Praashana* is also advised to do on the same day.<sup>20</sup>
- *Hamsodaka* a naturally processed water during *Sharadritu* and detoxified by *Agastya Nakshatra* is a best example for processing through *Kaala* (Seasonal factor).<sup>21</sup>

This indicates the effect of some seasons or a particular day of a planetary influence on the property of *Dravyas* (food or medicinal substances).

### 8. Vaasana (Rendering Fragrance)

The word flavoring collectively refers to taste and smell. On contact of some flavoring agents the food or medicine gets a new flavor. This method of rendering fragrance is aimed at making the preparation a pleasant one. E.g.

- *Ela* (*Elettaria cardamomum* Maton) is used to flavor the sweet dishes like *Kheer* or *Paayasam*. And also the cooling drinks like *Paanakam*

- *Dhataki* flowers (*Woodfordia fruticosa* Kurz), *Kankola* (*Piper Cubeba* Linn.F.), *Chandana* (*Santalum album* Linn.), *Jaatiphala* (*Myristica fragrans* Houtt.), *Lavanga* (*Syzygium aromaticum* (Linn.) Merr. & L. M. Perry), *Twak* (*Cinnamomum zeylanicum* Blume), *Ela* (*Elettaria cardamomum* Maton), *Patra* (*Cinnamomum tamala* Nees & Eberum), *Nagakesara* (*Mesua ferrea* Linn.), *Lodhra* (*Symplocococus recemosa* Roxb.), *Kasturi* (*Abelmoschous moschatus* Medik) etc. are also used for *Vaasana Samskara* (flavoring) in *Sandhana Kalpas* (Fermentation) like *Draksharishta*, *Dashamoolaarishta* etc.<sup>22</sup>

- Seasoning of food: Taro plant (*Colocasia antiquorum* Schott.)<sup>23</sup> are inedible when raw and considered toxic due to the presence of calcium oxalate crystals, typically as raphides. Calcium oxalate is highly insoluble and contributes to kidney stones in raw form. The toxin is minimized by cooking, especially with a pinch of baking soda. It can also be reduced by steeping taro roots in cold water overnight.

- Pulses are fried with Ghee, Cumin seed and Asafoetida. As Pulses increase *Vaata*, Ghee pacifies *Vaata* due to *Snigdha* property. A cumin seed (*Cuminum cyminum* Linn.) does *Jarana karma*<sup>24</sup> (It increases G.I.T secretions & help in digestion). Asa-

foetida (*Ferula narthex* Boiss.) does *Vaataanuloman karma*<sup>25</sup> (directs the *Vaata* in its normal path).

### 9. Bhavana (Levigation)

*Acharyas* of *Ayurveda* have described *Taila* (oil) *Takra* (butter milk), *Gomutra* (cow's urine) *Aaranala* (sour gruel) *Kulattha kwatha*.

*Ayurvedic* formulations like- *Aamalaki Rasayana*, *Aamalaki churna* is levigated twenty one times by *Aamalaki swaras* (fresh juice). It increases the *Rasayana* properties (immunomodulatory properties).<sup>26</sup> It can be correlated with the different form of a drug e.g *Ayaskriti* can be formulated in the form of *Churna* (powder), *Avaleha* (lickable form), and *sandhana* (Alcoholic) form.

### 10. Kaala Prakarsha (Time duration)

- Newly grown rice is heavy to digest. After one year this rice is lighter to digest.
- Freshly collected *Guggulu* (*Nava Guggulu*) is *Brimhana* in nature and causes nourishment and acts as *Aphrodisiac* while, stored old *Guggulu* (*Purana Guggulu*) is *Lekhana* (Scraping/ Antilipidimic) in nature and causes scraping of *Kapha* and *Medo Dhatu* (adipose tissue).<sup>27</sup>
- *Ayurvedic* medicine like *Aasavas*, *Aristas*, Herbo-mineral preparations (*Rasau-shadhis*) gets better and better as time passes.<sup>28</sup>

- *Puraana Ghrtia* (Ghee stored for 10 years) is widely used in *Maanasa roga* (mental disorders).<sup>29</sup>

- The entities *Kaala* and *Kaala Prakarsha* differ from each other in a way that the *Kaala* refers to a season or a factor of time which brings about changes in the inherited properties of a *Dravya* were as the *Kaala Prakarsha* refers to a particular time duration which will be considered as a part of *Samskara* that brings transformation gradually in due course of time. The *Kaala* is explained in classics in the contexts of drug collection, preservation and shelf life of finished products and also about drug administration (*Bheshaja Sevana*). Though these contexts are not related to processing but contribute a lot in treatment (*Karya Phala/Chikitsa*) when delivering the final result of a drug in a particular disease is concerned.

### 11. Bhajana (Utensils)

Various metallic and non metallic utensils are used for cooking, serving, storage. Utensils have desired or undesired effects on food substances which are cooked in them. Material of utensils & their effects on body and specific utensil for serving food and medicaments is given in Table 3 and 4 respectively.<sup>30</sup>

Table 3: Specific Use of Utensils for various foods

Name of the Food item	Type of utensil best for storage
Ghee	Iron vessel
Curd preparations	Stony utensils
Juices and fruit syrups	Glass and crystal ware
Fruits and confectionary	Leaves like banana etc.
Boiled and cooled milk	Copper vessels
Wines, Beverages	Earthen pots
Peyas (Porridge), Edible fluids	Silver bowl

Table 4: Utensils &amp; their Effects on Human body

Type of Utensil	Beneficial effect on the Body
Gold	Rasayana,
Silver	Valipalitanasakam, Subside Vaata & Pitta
Zinc	Improves Intelligence & Appetite
Brass	Pacify Vaata & Pitta,
Iron/Steel	Useful in Jaundice
Glass	Cooling effect
Plates made from plant leaves	Useful in antidote against poison

*Jala/ Udaka* (Water) is essential for every living being. The *Ayurvedic* classics describe the qualities of water based on its sources like rain water, well water, river water etc. time of collection, processing. The water from clouds (*Aindra Jala*) is considered as superior among all types of water and has the *Tridosha Shaamaka* property. It is advised to collect the *Aindra jala* and boil before using (This is intended to overcome the possible contamination by micro organisms in the environment as it is collected directly from the sky) and store it in an earthen pot (it acts as a coolant).<sup>31</sup> The above description reveal that there can be more than one *Samskara* in a procedure as the place of collection refers to *Desha Samskara*, boiling refers to *Agni Sannikarsha* and storage in earthen pot refers to *Bhajana Samskara*. Similarly, water from other sources like well, river, reservoir etc. are being advised to collect in particular season which refers to *Kaala* and this has the effect on particular *Doshas* i.e. their variation in the body according to season (*Chaya-Prakopa- Prashama*).

An example about preparation of *Ghrita* (Ghee) is worth to be quoted here as it contains a combination of *Samskaras* like *Kaala*, *Agni Sannikarsha* and *Manthana*. Presently the ghee is prepared from cream base for commercial purpose and also by some undefinable pyrated sources, but

classically curd based preparation of ghee is indicated.

A Pharmacological study carried out at N.I.A Jaipur<sup>32</sup> reveals that the *Ghrita* prepared out of curd by classical method did not produce any hazardous effect on lipid profile of healthy volunteer, increased *Agnibala* (digestive power), improved working capacity on the other side, the cream based ghee produced insignificant results in objective parameters like HDL, LDL, Cholesterol and Triglycerides showing High lipid profile except LDL. This shows the upper hand of indigenous methods of food or pharmaceutical preparations (as ghee is used both food & medicine) and proves the significant role of *Samskara* in food and pharmaceutical preparations.

#### DISCUSSION AND CONCLUSION

The *Samskara* is intended to meet the quality needs of a food or pharmaceutical preparation. The quality of an ideal drug as per *Ayurvedic* classics can be achieved through *Samskara*. *Aahara* is mainly characterized based on its taste and nutritional aspects which is also again attained by proper way of *Samskara*. The food and pharmaceutical preparations need a proper handling not only by maintaining hygienic conditions during preparation but also by selecting proper vessel, proper time, proper duration etc. in order to make the preparation efficacious and stable for long duration.

*Samskara* play an important role in making a substance homogenous from a state of complexity, hence makes the food suitable for digestion, compatible to *Dhatu* and in case of Pharmaceutical preparations, *Samskara* helps to enhance the therapeutic value by improving the palatability and absorbable form.

Presently in pharmaceutical industries the preparations like *Kwatha* are prepared in closed steaming chambers which are actually not advised by Ayurvedic classics. The processing of *Sneha* is also not properly carried out as far as the time factor, time duration and other factors are concerned. This may prove to be satisfactory or beneficial manufacturing wise or marketing wise as there is a great need for *Ayurvedic* medicines in the market but not quality wise as per classics. The present competitive world has made life stressful and busy. Hence it is natural that India is opting for a Fast-food life style. This has thrown all rules and regulations of *Aahara Kalpana* aside mentioned by *Acharyas* in order to cope-up with the demand of hectic schedule ending up with anxiety and various lifestyle disorders.

The *Samskara* may prove successful only if the other factors like collection of genuine drugs at appropriate time with proper storing and manufacturing conditions are fulfilled along with proper time and way of Administration.

A food or pharmaceutical preparation is the result of more than one *Samskara* collectively. It is always expressed either as *Paaka* (In case of food) or *Kalpana* (in case of medicines). It is difficult to differentiate or mention a single *Samskara* behind any preparation. *Acharyas* and Commentators have explained them separately for better

understanding of contribution of each *Samskara* in any of the preparations.

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