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

Gupta Satish Chand

Sumanth Shenoy

Kotecha Mita

1Dept. of Dravyaguna, J. D. Ayurvedic Medical College, Aligarh, UP, India

2Dept. of Dravyaguna, National Institute of Ayurveda, Jaipur, Rajasthan, India

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. Swaasthyarakshana (Preventive aspect) and Vikara Prashamana (Curative aspect) where as the Aushadha deals with the balancing of deranged Doshas and restoring Swaasthya. 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, flavor, 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 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.

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

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 combinely. The comparison between present cooking methods with that of Ayurvedic classical considerations are in Table 1.

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Modern Modes of Processing</th>
<th>Methods</th>
<th>Classical Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>By moist heat</td>
<td></td>
<td>Toya-Agni Samskara (Kwathana)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Boiling</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Simmering or stewing</td>
<td>Toya-Agni Samskaara Over Manda Agni</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Steaming</td>
<td>Swedana</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Pressure Cooking</td>
<td></td>
</tr>
<tr>
<td>(B)</td>
<td>By dry heat</td>
<td></td>
<td>Agni Sannikarsha</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Baking</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Roasting</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Grilling</td>
<td></td>
</tr>
<tr>
<td>(C)</td>
<td>By frying in ghee or oil</td>
<td></td>
<td>Bharjana Samskara</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Shallow frying</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Deep frying</td>
<td>Taila/Ghrita Paaka or Talana</td>
</tr>
</tbody>
</table>

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 (Kaaryya) 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 (*Samyog*) 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**°: 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 *Vaakti & Paittik Prakriti*, steamed sprouts should be given.

   (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.
Putapaaka vidhi is explained for both food and pharmaceutical preparations. e.g. Cooking different types of meat (Maamsa) by means of Phala putapaaka, Vaasa putapaaka swarasa etc.

Agni Sannikarsha to water i.e. Kwathana (Boiling) is one of the water purification measures described in Sushruta Samhita. 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. 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. 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 for the purpose of Nirmaleekarana as Kataka Phala helps in sedimentation and settles the heavy ingredients and makes the Arishtha 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) & increases Kapha. When we stir adding water & remove butter then it becomes buttermilk which is lighter to digest, non-obstructive and reduces Kapha.

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. 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 were it is flowing or gets stored.

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 collective opinion from all the ancient texts of Ayurveda.18

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

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).19
- Swarna Praashana is also advised to do on the same day.20
- Hamsodaka a naturally processed water during Sharadritu and detoxified by Agastya Nakshatra is a best example for processing through Kaala (Seasonal factor).21

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 (Symlocos recemosa Roxb.), Kasturi (Abelmoschous moschatus Medik) etc. are also used for Vaasana Samskara (flavoring) in Sandhana Kalpas (Fermentation) like Draksharishta, Dashamoolarishta etc.22
- Seasoning of food: Taro plant (Colocasia antiquorum Schott.)23 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 karma24 (It increases G.I.T secretions & help in digestion). Asa-
foetida (*Ferula narthex* Boiss.) does Vaa-
taamuroman karma25 (directs the Vaata in its
normal path).

9. **Bhavana (Levigation)**

Acharyas of Ayurveda have de-
scribed *Taila* (oil) *Takra* (butter milk), *Go-
mutra* (cow’s urine) *Aaranala* (sour gruel)
*Kulattha kwatha*.

Ayurvedic formulations like- *Aama-
laki Rasayana*, *Aamalaki churna* is levigated
twenty one times by *Aamalaki swaras* (fresh
juice). It increases the *Rasayana* properties
(immunomodulatory properties).26 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. Af-
ter one year this rice is lighter to digest.
- Freshly collected *Guggulu* (*Nava Gug-
gulu*) is *Brimhana* in nature and causes nour-
ishment 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).27
- Ayurvedic medicine like *Aasavas*, *Aris-
tas*, Herbo-mineral preparations (*Rasau-
shadhis*) gets better and better as time
passes.28

- *Puraana Ghritia* (Ghee stored for 10
years) is widely used in *Maanasa roga*
(mental disorders).29
- 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 du-
ration which will be considered as a part of
*Samskara* that brings transformation gradu-
ally in due course of time. The *Kaala* is ex-
plained in classics in the contexts of drug
collection, preservation and shelf life of fi-
nished products and also about drug admin-
istration (*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 uten-
sils 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 re-
spectively.30

<table>
<thead>
<tr>
<th>Name of the Food item</th>
<th>Type of utensil best for storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghee</td>
<td>Iron vessel</td>
</tr>
<tr>
<td>Curd preparations</td>
<td>Stony utensils</td>
</tr>
<tr>
<td>Juices and fruit syrups</td>
<td>Glass and crystal ware</td>
</tr>
<tr>
<td>Fruits and confectionary</td>
<td>Leaves like banana etc.</td>
</tr>
<tr>
<td>Boiled and cooled milk</td>
<td>Copper vessels</td>
</tr>
<tr>
<td>Wines, Beverages</td>
<td>Earthen pots</td>
</tr>
<tr>
<td>Peyas (Porridge), Edible fluids</td>
<td>Silver bowl</td>
</tr>
</tbody>
</table>
Table 4: Utensils & their Effects on Human body

<table>
<thead>
<tr>
<th>Type of Utensil</th>
<th>Beneficial effect on the Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gold</td>
<td>Rasayana,</td>
</tr>
<tr>
<td>Silver</td>
<td>Valipalinasakam, Subside Vaata &amp; Pitta</td>
</tr>
<tr>
<td>Zinc</td>
<td>Improves Intelligence &amp; Appetite</td>
</tr>
<tr>
<td>Brass</td>
<td>Pacify Vaata &amp; Pitta.</td>
</tr>
<tr>
<td>Iron/Steel</td>
<td>Useful in Jaundice</td>
</tr>
<tr>
<td>Glass</td>
<td>Cooling effect</td>
</tr>
<tr>
<td>Plates made from plant leaves</td>
<td>Useful in antidote against poison</td>
</tr>
</tbody>
</table>

Jala/ Udaka (Water) is essential for every living being. The Ayurvedic classics describe the qualities of water based on its sources like rain water, wel 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). 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 wel, 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 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 dug 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 Dhatus 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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CORRESPONDING AUTHOR
Dr. Satish Gupta
Lecturer of Dravyaguna
J. D. Ayurvedic Medical College,
Aligarh, UP, India
Email: dr.sgupta1982@gmail.com

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