

The
Indian Central Oilseeds Committee

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for
Soap making
By
G. M. Kulkarni.



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by
Shri G. M. Kelkar, Chemist-in-Charge, Village Industries Research Laboratory,
Poona.

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NON-EDIBLE OILS FOR SOAP MAKING

The acute shortage of the edible oils for human consumption makes it imperative that special efforts be launched to retrieve this situation and supplement the dinner table of the common man with a larger quota of Fat. And here the humble soap maker has an important role to play by introducing non-edible oils in the soap industry, and by sparing for human consumption at least a part of the edible oils he is at present consuming for his industry.

As a modest beginning, he can help to spare about 50% of the valuable raw material that goes to give him the washing soap, if he will supplant it by the same percentage of non-edible oils, like Neem (*Azadirachta Indica*), Karanja (*Pongamia Glabara*), Undi (*Callophyllum Inophyllum*) oils etc.

This he can safely do without seriously impairing the quality of his soap, by adopting certain procedural modifications in order to render amenable the highly susceptible oils like Undi (*Callophyllum Inophyllum*), Neem (*Azadirachta Indica*), Karanja (*Pongamia Glabara*) etc. which otherwise form useful raw material at least for the washing soap industry.

It is common knowledge among soap makers that soap can be manufactured by three different processes; namely (1) The cold process; (2) The semi-boiled process; and (3) The full-grained process, or the full-boiled process. Of these, the first process is rather obscure and dilatory to be advocated for the manufacture of big tonnages of soap, while the last one is usually beyond the scope of small scale manufacturers. The semi-boiled process is thus the most practicable of all the three and is within easy reach of the humble soap maker, who can, by its adoption and by the use of non-edible oils referred to above contribute towards augmenting the available quota of Fat from edible oils for human consumption.

Procedure :—The semi-boiled process, requires expert supervision regarding the control of temperature and the completion of saponification. Although Neem (*Azadirachta Indica*) and Karanga (*Pongamia Glabra*) oils are easily saponifiable there is a marked tendency on their part to separate and saponification, does not seem to proceed straight to the point of completion. Another difficulty appears to be that the soaps from higher percentages of these oils do not admit of more water content than the barest requirement. In addition, these oils incline themselves to be abhorrent to Metanil, yellow, the colour most common to the washing soap while fillers or adulterants cannot be incorporated effectively and efficiently which incidentally is a blessing in disguise. Rosin with all its beneficent properties does not amalgamate itself with these oils and so it is safer to omit it altogether. Perfume has also to be so selected as to mask the strongly disagreeable odour of Neem and Undi oils.

A few methods can be suggested which can successfully obviate these difficulties.

The oils taken as per recipes given below are to be mixed and the mixture is to be heated to about 40° to 45°C in a soap boiling pan.

Recipe I	Recipe II
(1) Karanja Oil (Pongamia Glabara) 30%	Undi Oil (Callophyllum Inophyllum) 30%
(2) Neem Oil (Azadirachta Indica) 20%	Neem Oil (Azadirachta Indica) 25%
(3) Coconut Oil 30%	Coconut Oil 30%
(4) Groundnut Oil 15%	Groundnut Oil 15%
(5) Castor Oil 5%	Castor Oil 5%
(6) Caustic Lye (16% solid in 34 Be solution)	Same as for I
(7) Colour—Rhodamine	Same as for I
(8) Perfume (Citronellal, Lemon grass oil, Palma rosa etc.)	Same as for I

To the mixture of oils in the pan at 40°C, add slowly the caustic soda solution, when the oils will assume a slightly yellowish thickening consistency. Stirring the mass continuously, raise the temperature to 48° or 50°C, although the mass has by now thickened wonderfully well, the surface assumes an oily appearance indicating incomplete saponification or incoherent mixing.

This has to be effaced and saponification ensured, by a careful and cautious maintenance of the temperature between about 50° to 55°C over a certain duration of time while at the same time the slightest tendency to grain should be guarded against.

A higher temperature or a longer time of heating at the same temperature is likely to encourage the formation of grains and is thus bound to impair seriously the quality of the product.

It would therefore appear that a successful "Modus Operandi" for the utilisation of these non-edible oils largely depends upon this particular factor namely temperature control and the duration of heating. To achieve this end means skilful handling of the fire by successively cooling and heating the contents of the pan between the aforesaid tempera-

tures. (50°C to 55° C), so as to avoid graining and to induce saponification till the complete formation of a perfect emulsion of soap.

This can be accomplished by a contrivance in the soap boiling pan by which a liquid medium like water can be interposed between the bottom of the pan and the fire to serve as a sort of water bath to ensure uniform and gradual heating.

For this purpose a double jacketed parabolic pan with empty space to contain water to serve the purpose of a water bath as intended above can be successfully used. By this means the temperature can be efficiently controlled, while the attendant gradual-cooling of the mass helps to accelerate the reaction in the pan.

Once the water of the bath is heated to 70° to 80° C, the heat maintained is sufficient to effect the reaction right up to the formation of soap-emulsion at the framing stage. A very small quantity of concentrated solution of Rhodamine and the necessary perfume should be added at the stage before framing the soap-emulsion.

The above pertains largely to the inclusion up to 50% of non-edible oils in the manufacture of washing soap. If the average soap maker chooses to include smaller percentages (say 10 or 20%) of non-edible oils in the raw materials that go to give him his soap, the process of manufacture will require less skill and will enable him to carry out the manufacture of washing soap without much difficulty. Hence it is advisable for the average soap makers to do so, and depending upon the initial success they may increase the percentage of non-edible oils in their process in gradual course.

Quality of the Product :—The quality of the product as a washing soap was tested and the following analytical results have been given which will fully bear out the utility of such soaps.

Moisture	Fatty Acid	Total Alkali	Free Alkali	Fillers
15.8%	73.2%	10.9%	Nil	Nil

Soap cakes, expertly made from these oils, have a stout body with a soothing touch wearing sparingly, lathering profusely, and washing comparably well with the popularly good quality soaps of the market.

However, their popularity among the consumers is likely to be restricted if their colour is not matched skilfully and perfume blended aromatically so as to mask completely the original dirty grey shade and the strongly abominable odour. The colour recommended for this purpose is Rhodamine. It should however be noted that the slightest excess

of this colour will scare the customers away with its ugly reddish base. Moreover a blend of smells which would induce a customer to buy non-edible oil soaps will have to be skilfully selected.

Turning to the economics of such a method, it would be extremely difficult to give concrete figures especially in the absence of reliable statistical data. It should be borne in mind that these non-edible oils as sold in the urban markets at an apothecary are very costly (Rs. 4/- per seer), and the soap made from these oils cannot therefore be an economic proposition.

However, in striking contrast to the above, these oils are available at very cheap rates in the rural areas where the seeds are grown in plenty and their oils extracted.

On the Konkan side at Ratnagiri, Dapoli, and other places Undi (*Callophyllum Inophyllum*) is available in large quantities and at low prices. In Solapur, Poona and similar other districts Karanja (*Pongamia Glabara*) and Neem (*Azadirachta Indica*) oils can be had at cheaper rates.

The cost price of the soap prepared with such oil is likely to be cheaper than the other soaps and therefore factories can begin to practise replacing 50% of the edible oils they are now consuming, by the non-edible variety.

Even when non-edible oils have to be transported for some distances the economics of their usage in the manufacture of washing soaps can at least be brought on par with that of the present soap industry that consumes 100% edible oils.

Even if these soaps (from 50% non-edible oils) are not cheaper, or are slightly costlier than the prevalent market samples of washing soap it is desirable to encourage the utilisation of non-edible oils in this industry and thus to relieve the shortage of edible oils. The introduction by manufacturers, of these non-edible oils in the soap industry, and the literal consumption of such soaps by the consuming public, would be both a patriotic duty and a useful innovation.