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Make your own gulaman from seaweeds

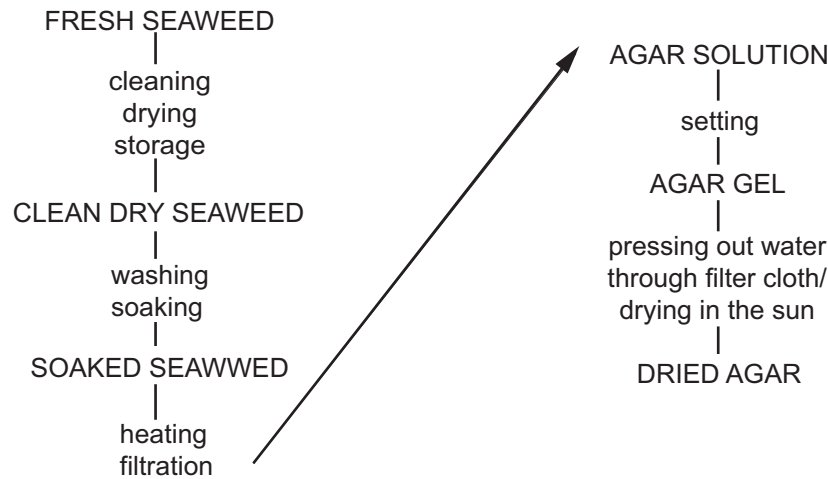
Aquaculture Department, Southeast Asian Fisheries Development Center

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An outline of the agar extraction procedure is given below:



Extraction trials

Trials were conducted with small (100 g/l) and large (1 kg/10 l and 2 kg/20 l) samples of seaweed. The small (100 g) samples of seaweed (ground or un-ground, bleached or un-bleached) were heated in 1 l of water for 1, 1.5, 2, or 2.5 h in a water bath, or heated directly. The larger samples were heated directly for 2, 3, or 4 h. All trials were conducted with samples from the same batch of seaweed, which was collected from a seaweed farm and fully dried. Water was added if substantial evaporation occurred during heating, and the water temperature was kept at 90-95°C. The seaweed residue was heated for a second time in 500 ml water for 20 min (100-g samples), in 4.75 l for 1 h (1-kg samples) or in 10 l of water for 1.5h (2-kg samples).

The data have not been analyzed statistically, since trials are continuing. The average agar yield obtained using this extraction method was 16% and is considered satisfactory. There were no big differences in agar yield between heating the seaweed in a water bath or heating it directly.

Source: *Extraction of Agar from Gracilaria edulis as a Village Level Technology - Preliminary Results* by B.A. Lalkman in **Gracilaria Production and Utilization in the Bay of Bengal**, Bay of Bengal Programme for Fisheries Development, Madras, India, November 1990.

Item six

Make Your Own Gulaman from Seaweeds

Seaweeds are locally produced into gulaman, a favorite dessert among children and adults. Gulaman is sold at the local markets in bars and is relatively easy to prepare.

Materials needed:

raw seaweeds (*Gracilaria*, *Gracilariopsis*, *Pterocladia*, *Gelidium*, *Getidiella*)
vinegar or 0.1 N sulfuric acid (H₂SO₄) available at the drugstore

commercial sodium thiosulfate ($\text{Na}_2\text{S}_2\text{O}_3$), also available at the drugstore trays, basins, or any aluminum container; big kettle or vat; strainer or cheesecloth bamboo matting or wire screen; ice; salt

Procedure

1. Select freshly harvested seaweeds gathered early in the morning or during low tide.
2. Wash the seaweeds with freshwater and drain thoroughly.
3. Spread the seaweeds into thin layers over wooden trays or in any clean container and dry under the sun for one week.
4. Resoak seaweeds in freshwater for 5-10 min. Dry again under the sun until the color of the seaweeds turns dirty yellow.
5. Once the seaweeds are dried, bleach them with weak acids like vinegar until the color turns olive green. One hundred g of dried seaweeds is either soaked in a solution of 3.5 l of water and 90 ml of 0.1 N sulfuric acid or soaked in a solution of half a liter water and 2.5 g of commercial sodium thiosulfate.
6. Drain the bleached seaweeds and sun-dry until sufficiently dried (light brown in color).
7. To the dried seaweeds, add 3.5 l of water and a diluted solution of vinegar until slightly acidic to taste. Allow this to boil for 30 min to 1 h while constantly stirring the solution. Boiling can be repeated until the solidification of the extracted agar is difficult to achieve.
8. After boiling, strain the seaweeds using ordinary cheesecloth. Separate the liquid portion from the plant residue.
9. After extraction, allow the filtered extract to cool and solidify. Once it is hard enough, cut into strips or bars or to any desired form.
10. Pack the gulaman strips or bars into an ice box with dry ice or wrap them in cheesecloth with ice and salt; keep the bars intact for 2-3 days.
11. Thaw the gulaman bars by placing them on bamboo mattings or wire screen and allow them to dry at room temperature.
12. Finally, allow the extracted thawed agar to dry under the sun until the desired texture is obtained.
13. Cool the gulaman bars before packing and storing.

Source: *Make Your Own Gulaman from Seaweeds* by Dalisay de Guzman and Ginna Guiang, Fisheries Research Department and Applied Communication Department, PCARRD, February 1987.

Item seven

Regulations on Seaweed Gathering/Farming

Salient provisions from Fisheries Administrative Order No. 108 (1973-09-13, Series of 1973) are as follows:

Section 2. Gathering and/or culture of seaweeds

No person, partnership, association, corporation, or cooperative shall gather seaweeds in areas designated by the Director as seaweed restricted areas and seaweed farm lots or culture seaweeds in any public water area in the Philippines without any of the following permits or license