

# Village level processing techniques

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Agar bearing seaweeds *Gracilaria* spp. and *Gelidium* spp. grow abundantly in the Asia-Pacific region. They grow well in a wide range of salinity. In the Philippines, they naturally grow attached to marine fish cages and mangrove roots in brackishwater areas. Long utilized as food by coastal dwellers, the production of seaweeds for commercial purpose is fairly recent. Studies in the Philippines have shown that a good number of the coastal populations in the southern and central part of the country are presently engaged in full time seaweed farming. Thus, the production and post harvest techniques and methods for processing *Gracilaria* to produce agar suitable for local market is necessary to augment the meager income of coastal dwellers.

In India, seaweed collection is also an important source of income in fishing villages along the coasts, particularly the Ramanthapuram district in Tamil Nadu. *Gracilaria* spp. and *Gelidiella* spp. are collected through most of the year by men and women. A report by Kalkman in 1989 noted that the seaweed is sold to middle men very cheaply who then dry the seaweeds before selling them to processing industries. Thus, the village level method of extracting agar might be suitable for use in these parts of India in order for the villagers to increase their income.

In Thailand, a step by step method of crude agar extraction has also been formulated by the government's Biopolymer Research Unit. Its purpose is also to enhance income of coastal seaweed gatherers.

A flow diagram of a village level agar production is shown next page.

## STANDARDS

It is important to know the acceptable standards specified by buyers of agar. It will help processors to have a rough estimate of the cost of their processed agar.

Here's a guide on the quality of dried seaweeds:

*Class A:* High price; moisture content is 18- 20%. Single species dried seaweed. Clean, without contaminants of foreign

materials such as shells, salts, sand, plastic, epiphytes, *Ulva*, crustaceans, corals, and mud.

*Class B:* Good price; single species dried seaweed. With minimal contaminants of foreign materials.

*Class C:* Low price; mixed species dried seaweed. Contain contaminants of foreign materials.

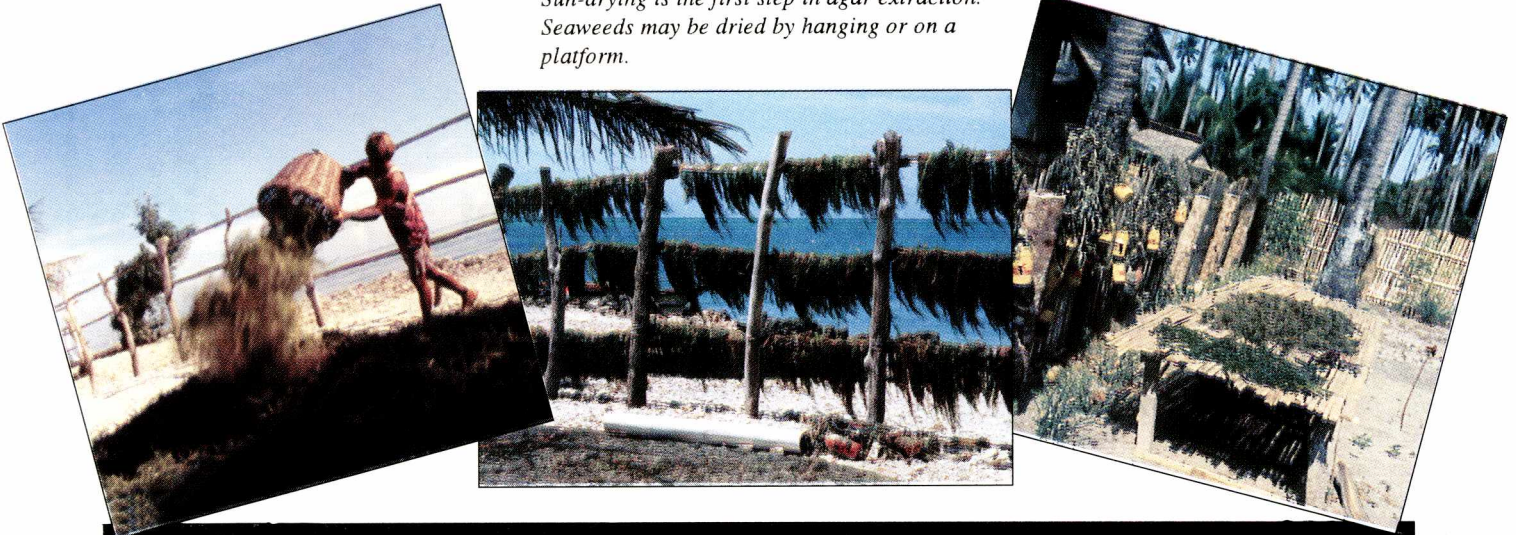
## Specification of processed agar for Japan

Criteria	Grade			
	Special	1	2	3
Gel strength (g/cm <sup>2</sup> )	600 or more	300 or more	250 or more	150 or more
Water content	22% or less	22% or less	22% or less	22% or less
Crude protein	1.5% or less	1.5% or less	2.0% or less	3.0% or less
Solid insoluble in hot water	0.5% or less	2.0% or less	3.0% or less	4.0% or less
Crude ash content	4.0% or less	4.0% or less	4.0% or less	4.0% or less

## Agar specification of United States Pharmacopia (USP) and Food Chemical Codex (FCC)

Criteria	USP	FCC
Microbial limit ( <i>Salmonella</i> )	negative	negative
Maximum water content	20%	20%
Maximum total ash	6.5%	6.5%
Maximum acid insoluble ash	0.5%	0.5%
Maximum foreign organic matter	1.0%	negative
Maximum foreign insoluble matter	1.0%	1.0%
Arsenic	3 ppm	3 ppm
Lead	10 ppm	10 ppm
Heavy metals	40 ppm	40 ppm
Foreign starch	negative	negative
Gelatin	negative	negative
Maximum water absorption	75 ml	75 ml

Sun-drying is the first step in agar extraction. Seaweeds may be dried by hanging or on a platform.



**Small - scale agar production**

from dela Pena, PO. 1994. A guide to agar processing and quality of *Gracilaria* species. DA-BFAR; UN-FAO, Manila, Philippines.

