# EFFECT OF HARVEST AND POST-HARVEST PROCESSING METHODS ON QUALITY OF BÊCHE-DE-MER IN FIJI ISLANDS

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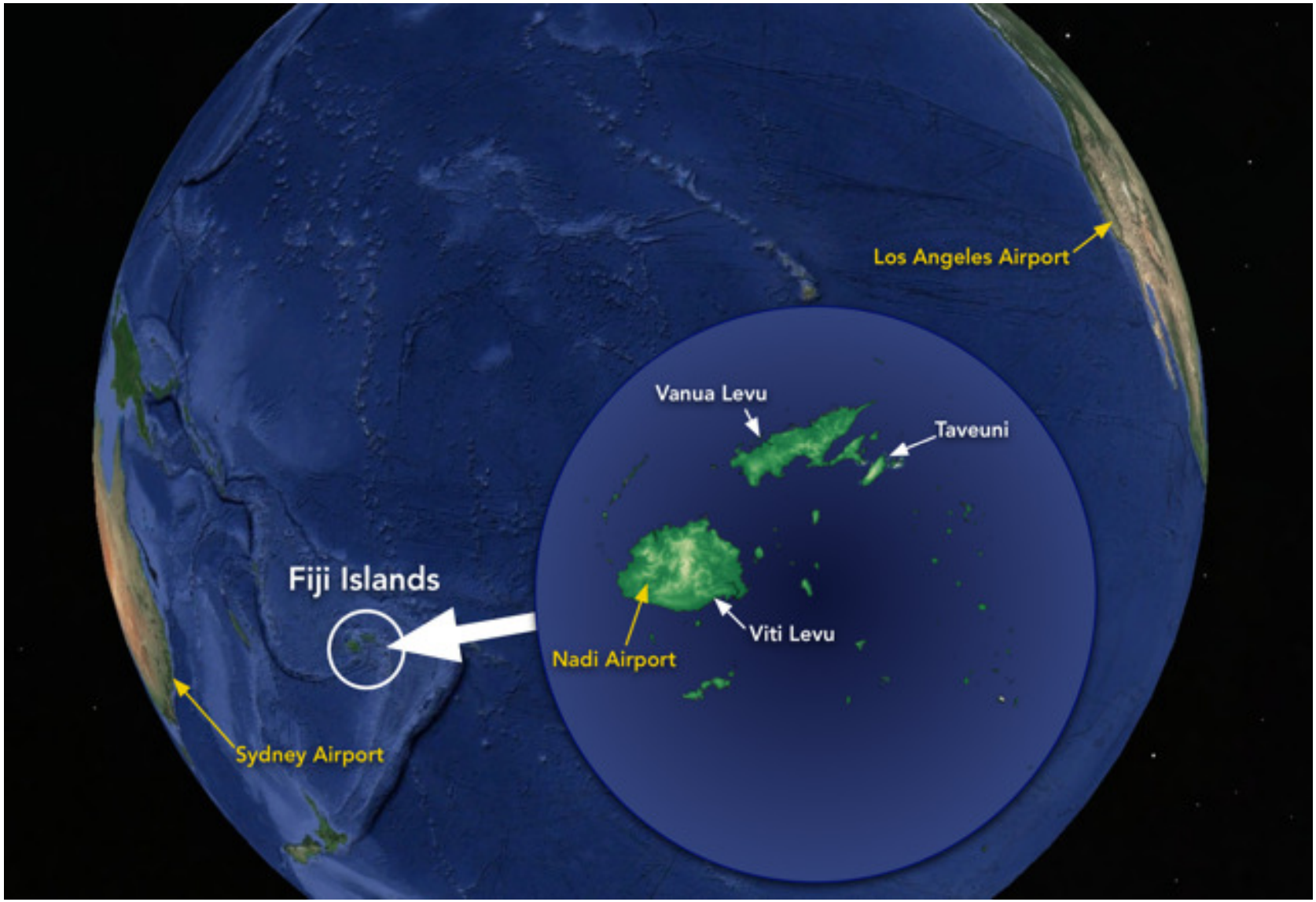
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# Introduction

- Sea cucumber a delicacy for Asians
- Harvested in Fiji for over 2 centuries
- Sea cucumbers are nutritionally rich in protein (43%), minerals (21%), fatty acids (5-61%).
- Has a number of health benefits and serve as a tonic and traditional remedy for hypertension, asthma, rheumatism, cuts and burns, impotence and constipations.
- Sea cucumber in perishable state processed to a dry form known as bêche-de-mer.
- Simple processing – boiling and drying stages

# Location of study site




Source: http://www.taveunidive.com/sg_userfiles/world_according_to_Fiji_Map.png

# Materials and Methods

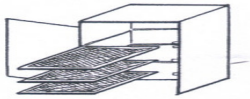
- Data collected through formal and informal interviews with the fishers (n=86), middleperson (n=8), and the bêche-de-mer exporters (n=5) (Chinese nationals).
- Data analysed using SPSS statistical software by the method of Logistic regression and Hosmer and Lemeshow test.

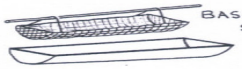
# Results and Discussion

- Sea cucumber processing technique used in Fiji Islands

# BECHE-DE-MER PROCESSING

## EQUIPMENT


SMOKE SHED


BOILING TANK


BASKET OR SCOOP
DIVING GEAR


KNIVES (VERY SHARP)


SHARPENING STONE


PUNT


DRI-BOMB


FIRE WOOD


SACKS

## RECOMMENDED TYPES

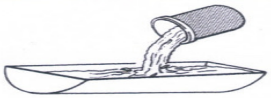
| (FIJIAN) | (ENGLISH) |
|---|---|
| SUCUWALU | TEAT FISH |
| DRI LOLI | LOLLY FISH |
| LOALOA | BLACK FISH |
| DRI TABUA | LOLLY FISH |

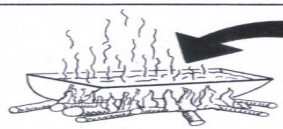
THE LARGER THE BETTER



## FIRST BOILING COOKED UNTIL SWOLLEN 5-15 MINUTES


SORT BY SIZE


ADD CLEAN SEAWATER


FIRE FULL BOIL


ADD PRODUCT



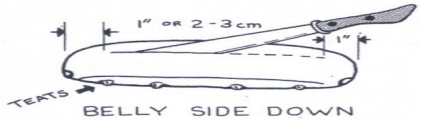
INSPECT FREQUENTLY

**TEST**

REMOVE WHEN IT'S
- STARTS TO SWELL

OVERCOOKING CAUSES IT TO BURST

## SLITTING THE BODY



BELLY SIDE DOWN

DO NOT CUT FURTHER --- IF SO IT WILL NOT CLOSE PROPERLY

## SECOND BOILING COOKED UNTIL HARD AND RUBBERY


REPEAT BOILING ADD PRODUCT STIR AND INSPECT

**TEST**

REMOVE WHEN IT'S
- SHRINKS SLIGHTLY
- BECOMES HARD/RUBBERY

OVERCOOKING CAUSES IT TO BECOME SOFT & SMALL

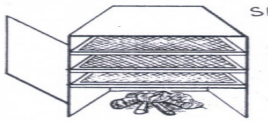

PLACE IN COLD WATER TO COOL

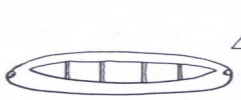
## REMOVING THE GUTS

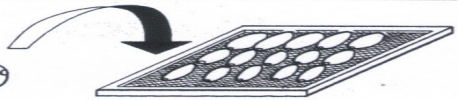

CUT OUT GUTS LEAVE NO STUBS AT THE ENDS

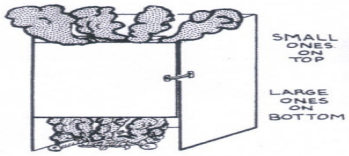
DO NOT REMOVE INNER TISSUE LINING

## SMOKING AND DRYING

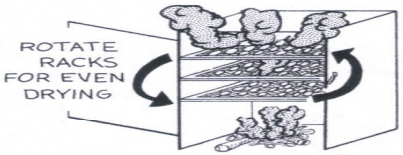




PLACE STICKS TO OPEN AND SPREAD


PLACE SLIT SIDE DOWN TOWARDS FIRE

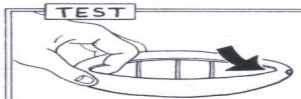


START FIRE PLACE THE RACKS AND CLOSE THE DOOR

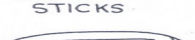


SMOKE

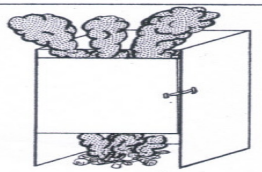
**TEST**


AFTER 4 TO 5 HOURS CHECK FOR WETNESS IF DRY

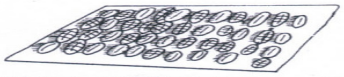

REMOVE STICKS


PRESS TOGETHER


TIE OPEN ONES STRAIGHTEN BENT ONES


SMOKE FOR 12 TO 16 HOURS

## SUN CURING

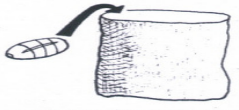

PLACE IN SUN FOR 2 TO 3 WKS. DAYS ON CLEAN DRY SURFACE


WATCH FOR RAIN KEEP DRY


AT NIGHT COLLECT AND STORE IN DRY PLACE

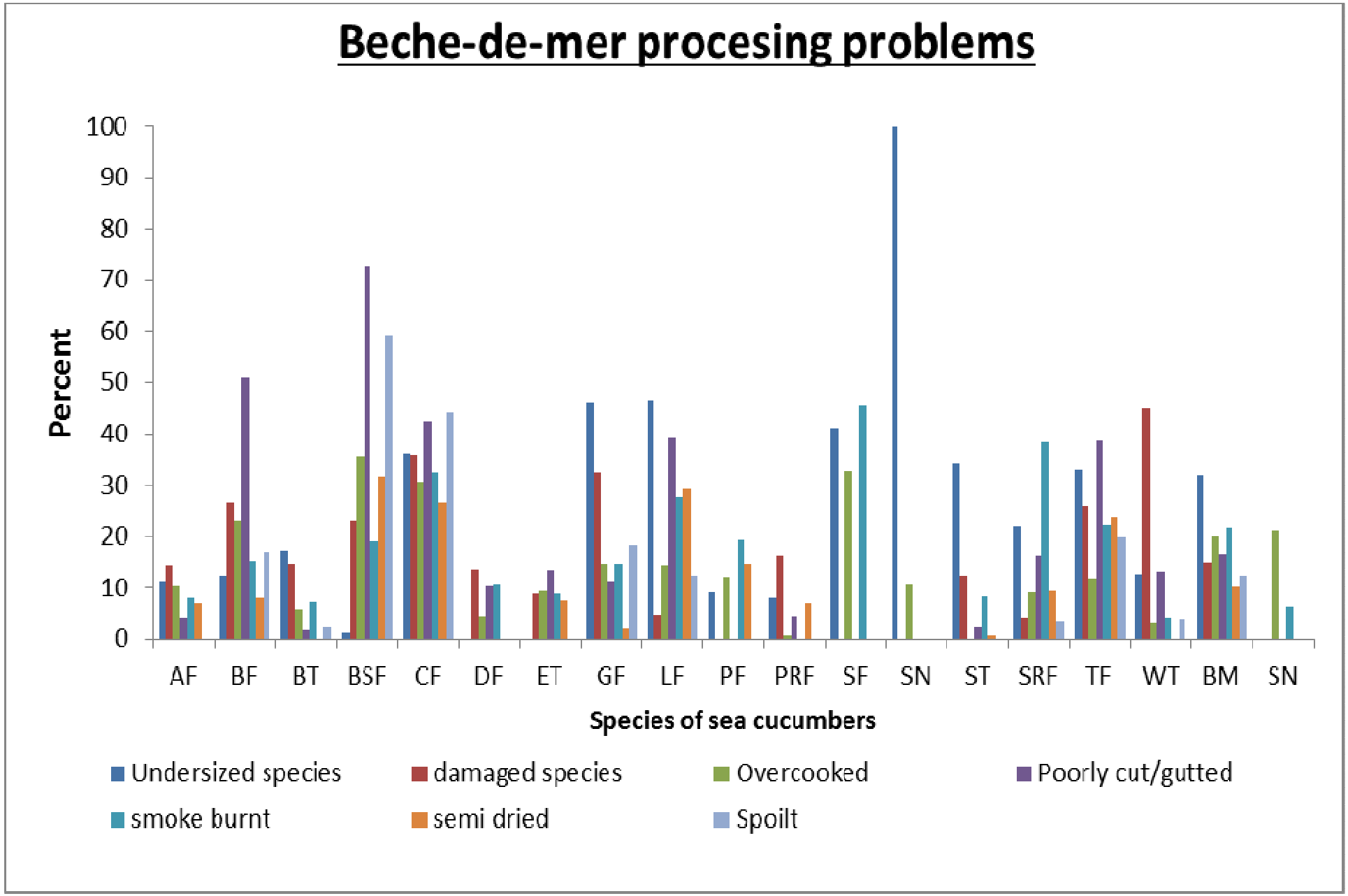
**TEST**


WHEN WHITE POWDERY SUBSTANCE FORMS CURING & DRYING IS COMPLETE


PACK & STORE IN A DRY CLEAN SACK

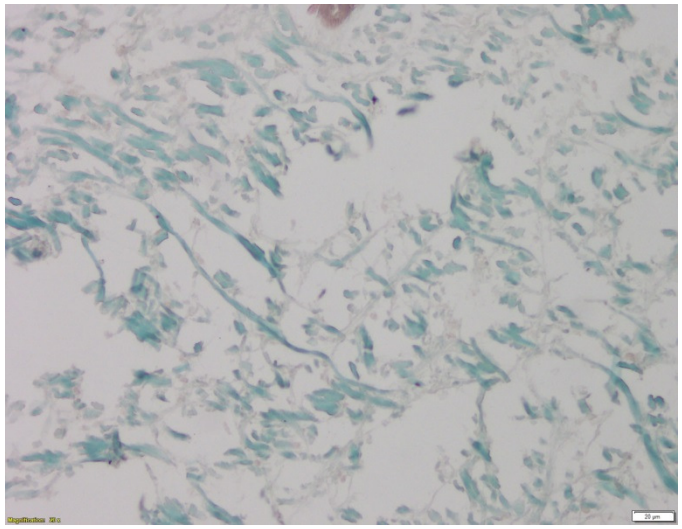
**NOTE**

IF;
- DRIED PRODUCT BECOMES WET REDRY
- STORING FOR LONG PERIODS CHECK FOR SPOILAGE ONE SPOILED PRODUCE CAN SPOIL THE ENTIRE SACK

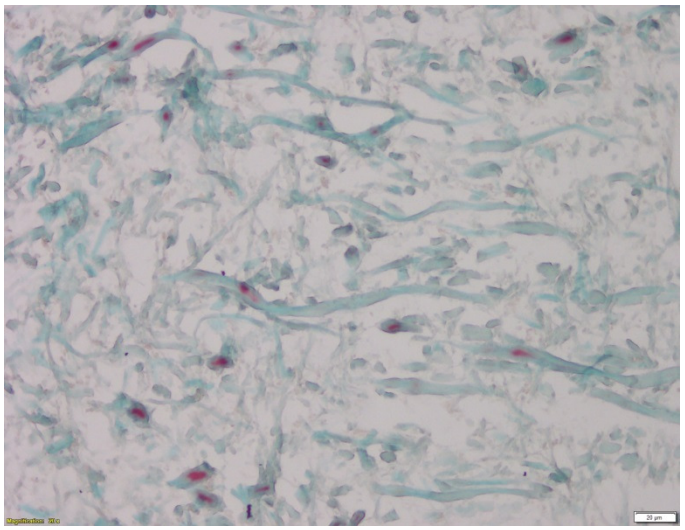



first cook, cutting and gutting, smoke drying ($P \leq 0.04$; $P \leq 0.05$)

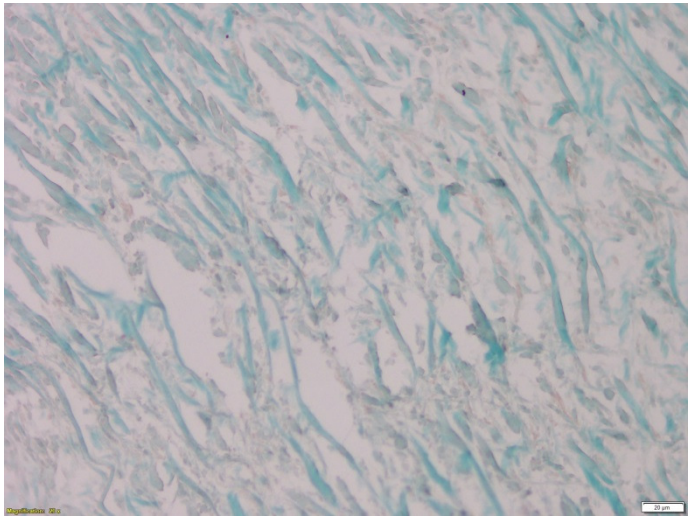
# Collagen stain – dry salting process



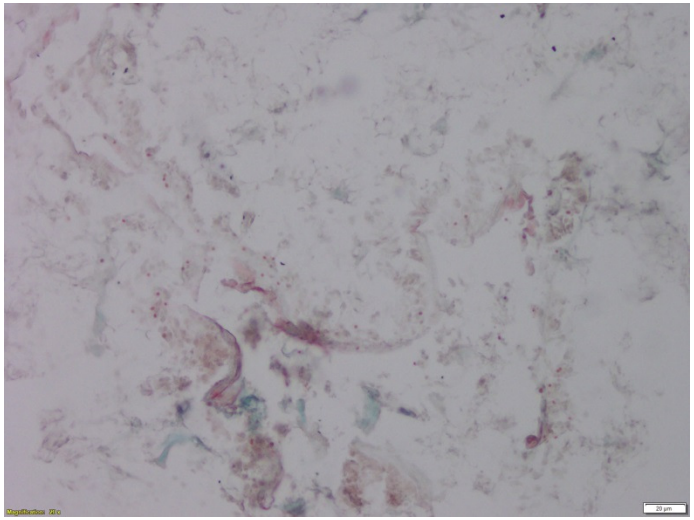
24 hours



36 hours



48 hours



72 hours

Picrogomori stain



# Species difficult to handle



*Holothuria hermanni*
(Curry fish)

*Stichopus Chloloronotos*
(Green fish)



# Poorly smoked products









# Poor quality products





# *Good quality products





# Implications

- Improving the processing techniques will help the fishers of the Pacific to process better yield.
- Processing manuals be designed for individual species and distributed to fishers and processors conversed in vernacular languages (currently underway)
- Workshops/training and awareness be raised on sea cucumber harvesting and processing

# Conclusion

- Sea cucumber processing technique in Fiji is used from the 1800's
- Processed by series of boiling and drying process
- First boil, cut and gut and smoke drying were difficult steps in processing technique identified by the processors
- Follow up study in progress ("*Impacts of processing techniques on quality and nutritional composition of tropical sea cucumbers*"- JCU)

# References


- SPC, *Sea cucumbers and beche-de-mer of the tropical pacific. Handbook No. 18*. 1994, Noumea: SPC. 51.
- Seeto, J., *Bêche-de-mer processing – a little more effort to get much more money while saving precious resources.* SPC Bêche-de-mer information bulletin, 1999. **11**: p. 2-3.
- Sachithananthan, K., et al., *Report on the national workshop on fish handling in Zanzibar*, in *United Republic of Tanzania and report on the Tanzania/ SWIOP national workshop on Bêche-de-mer processing*. 1985, National workshop on fish handling. p. 45-83.

# Thank you




Source: https://i.chzbgr.com/maxW500/5895416832/h88F92155/