

Optimizing the extraction of kavalactones during preparation of kava beverage

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Why optimize ?

To get a better return on investment in kava whether commercially or personally prepared.

Kava is expensive- \$33 kg retail as fresh, ground and frozen.



What do we know about kava as beverage.

Kava beverage is a complex unstable suspension- it settles into various layers.

Kava solids are briefly suspended then settle.

Kavalactones are poorly water soluble.

Kavalactones are emulsified as lipid droplets in water.

Starch particles are dissolved and suspended.



How is kava processed ?

Fresh cleaned root and stump can separated or mixed.

Kava be procesed as:

Fresh: ambient to 5C

Frozen: whole or chopped stored -5 to - 20C

Dried: whole root, stump chips 20- 30 mm, or coarsely chopped 5-10 mm, sun or mechanically dried, 40 - 60C too hot imparts cooked flavor.



Factors investigated to affect amount of KLs removed during beverage preparation

Plant part : root vs. stump

Prior storage: frozen vs. dry

Water temperature: 20 vs. 45 C

Size of kava pieces: coarse 5-10 mm vs. fine < 1 mm

Kava to Water Dilution (g/mL): 1:1 vs. 1:3

Agitation: hand knead vs. 18,000 rpm blender

Duration of agitation: 60 vs. 120 seconds

Cycles of agitation: 1 vs. 3



Harvesting and cleaning



Results

Trt #	Part root /stump	Particle size Small/large	Storage Dry/frozen	Temp C	Dilution 1/3	Cycles of agitation	Seconds of agitation	Agitation Knead /Blender	% KL removed
1	R	S	D	45	1	1	60	K	7
2	S	L	D	20	1	1	60	B	17
3	R	L	F	45	3	1	60	B	21
4	S	S	F	45	1	1	120	B	21
5	S	S	F	20	3	1	60	K	13
6	S	S	D	20	1	3	120	K	12
7	R	S	D	20	3	1	120	B	15
8	R	L	F	20	1	1	120	K	5
9	S	L	F	45	1	3	60	K	7
10	R	L	D	20	3	3	60	K	11
11	S	L	D	45	3	1	120	K	25
12	R	L	D	45	1	3	120	B	45
13	R	S	F	45	3	3	120	K	54
14	R	S	F	20	1	3	60	B	28
15	S	L	F	20	3	3	120	B	19
16	S	S	D	45	3	3	60	B	14



Conclusions

Factors for increasing the % KLs removed from the kava to the beverage in order of significance.

*Duration of agitation: 120 seconds > 60

*Water temperature: 45C > 20C

*3 cycles of agitation & squeezing > one

*Agitation: blender > kneading

ns Water volume: 3 times kava weight > 1

ns Size of kava pieces 0.5 mm > 3 mm

ns Storage: frozen > dry

ns Root = stump

