

**PM Formalisation of  
Micro Food Processing Enterprises Scheme**

**HANDBOOK  
OF  
PROCESSING OF MIZO CHILLI**



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## ABBREVIATIONS & ACRONYMS

<b>Sr: No.</b>	<b>Abbreviations &amp;Acronyms</b>	<b>Full Forms</b>
1.	Al	Aluminium
2.	ARIMA	Autoregressive integrated moving average
3.	ARCH	Auto regressive Conditional Heteroscedasticity
4.	BOPP	Biaxially Oriented Polypropylene
5.	CIP	Clean-in-Place
6.	FPOs	Farmer Producer Organizations
7.	FIB	Flexible Intermediate Bulk Containers
8.	FIFO	First in First Out
9.	FSS	Food Safety and Standards
10.	FSSAI	Food Safety and Standards Authority of India
11.	FoScoS	Food Safety Compliance System
12.	GST	Goods and Services Tax
13.	GARCH	Generalized Autoregressive Conditional Heteroskedasticity
14.	HCL	Hydrogen Chloride
15.	HDPE	High-density polyethylene
16.	LIFO	Last in first Out
17.	MoFPI	Ministry of Food Processing Industries
18.	LDPE	Low- density polyethylene
19.	MET	Metalized Polyester
20.	PA	Polyamide
21.	PET	Polyesters
22.	PE	Polyethylene
23.	PLC	Programmable Logic Controller
24.	PP	Polypropylene
25.	SARIMA	
26.	SHE	Safety Health Environment
27.	SHGs	Self Help Groups
28.	UV	Ultraviolet
29.	UPS	Uninterruptible Power Supply
30.	WTP	Water Treatment Plant



# CHAPTER – 1

## INTRODUCTION

Hmarcha (*capsicum annum L.*), solanaceae family ami niin America ram a hmun lum leh hnawng atanga chîn chhuah ani a, hmuihmer leh bawlhlo a telh mâkmawh niin sumdawnaah hmun pawimawh tak a luah bawk. Mizoram Bird Eye Chilli tia hriat Mizo Hmarchatê hi damdawi hmang a siam hlô, lei thâ leh rannung thahna hmanglo in kângvarah chîn thin a ni a, lo hâlna lei âl ah Potash (leitha chikhat) a tam avangin a hmin hnuin a rawng a sen thin. Khawvel hmarcha thak ber te zingah telh ani. Mizo hmarchate hi inches chanve lek a sei a ni a, a rah tirh hian a hring niin, a hmin hian a sen tái hlar thin. Government of India chuan kum 2015 March ni 23 khan Mizoram chu a chîng chhuak tu leh neitu (Geographical Indication) nihna a pe a. Mizo Hmarchatê hi chi thumah then niin, Grade A- hengte hi centimetre khat lek a sei, a tê ber leh sîn ber leh thak ber ani a, a lâ berin hralh kal ber ani bawk. Grade B- a kawr a chhah hlek a, a sei hlek bawk. Grade C- heng hmarcha hi Grade B kan sawi ang a chhah mahse sei deuh zawk an ni thung. India hmarchhak state ah lô vah zawh kângvar ah chin thin niin, an chîn thin lar zual te chu Arka Lohit, King Chilli, Bird Eye Chilli (Mizo Hmarchatê), Dulle Chilli, Pant C-1 and Pusa Sadabahar. Mizo Hmarchatê te hian SHU -Scoville Heat Unit (hmarcha thak zawng tehna) 50,000-100000 an nei a, King chilli hian SHU sang zawk a neih avangin India rama hmarcha thak ber nihna a hauh a ni. Hmarchatê hi November leh March inkarah lawh/seng thin ani a. Clover company te hian Miizo Hmarchatê tons 3000 leh King chilli tons 400 an tharchhuak thin a, a duh te tan hmarcha rô leh hmarcha dip te an siam tel thin bawk. Hmarcha hian thatna tam tak mai a nei a, cancer a veng a, thau chhia a paih a, nachhawk nan te, chaw paih tawih a ti awlsamin thisen a siam bawk, zun thlûmah pawh a tha hle. Hengte bakah hian chaw tha kan taksa mamawh ascorbic acid te, vitamin A, vitamin B1 leh B2, malcium, magnesium, phosphorus, protein leh beta carotene te a pai tel a ni.

### 1.1 Hmarcha hmanga India sumdâwnna:

India hi khawvel a hmarcha ro thar chhûak leh thawn chhuak tam ber ram a ni a. Hmârchhak tlang ramah kângvarah chin tam ber a ni. Kum 2017 a ramchhung atanga bungraw thawn chhuah tam ber niin, bungraw thawnchhuah atanga 72-92% lai a chhût a ni. India atanga Hmarcha an rama la lût tam ramte chu Vietnam, Thailand, Sri Lanka leh Indonesia te an ni a. Kum 2019-2020-ah khan hmarcha chîn nan India-ah ram hectares nuai 7.33 hman niin, tonnes nuai 17.64, hectare khat zel a Kg 2400 thar chhuak anga chhût a ni. Andhra Pradesh chu India ram a hmarcha thâr chhuak tam ber niin, tonnes nuai 6.30 lai an thâr chhuak thei a ni.

Teja leh 334 tia kan sawi hmarcha, science hmanga an nihna siam danglam chu hralh kal leh lar tak a ni. Ei tur siam danglam leh sawngbawlte hi a hlutna nîtin a san zel avangin, hmarcha thar leh

sawngbawl kawngah ramin a mamawh zat a neih theih nan theihtawp chhuah mêk reng a ni. Mizoramah hian kum 2016-2017 khan ram hectares 11,000 chu Hmarcha chîn nan hman niin, metric tons 10,727.35 a thâr chhuak thei a, heta a tam zawk chu thenawm ram, Assamah thawn chhuah a ni. Andhra Pradesh, Telangana, Madhya Pradesh, Karnataka leh West Bengal te hi India rama Hmarcha thâr chhuak tam zual an ni a. India thar chhhuah zawng zawng zâ zêla 35, 17, 12, 11, 6 zet hi heng ho ram hian an thar chhuak a ni. Guntur, Warangal, Khammam, Mahabubabad, Gadwal, Hindpur, Suryapet district a thingtlang mi tam zawk chuan Hmarcha hi an chîng a, heng district-te hi Hmarcha rô leh Hmarcha dip India-in a hralh chhuah kawng a tangkai leh thawh hlawk tak an ni. Guntur district Andhra Pradesh a mi hi Khawvel a Hmarcha zawrhna hmunpui tih hâl a ni. Kum 2020 leh 2021 fûr Hmarchate chu a seng hun January leh March 2021-ah chuan, quintal khat chêng 9500 ni phâk turin Telangana chuan a chhût lawk a ni. Amaherawhchu, Khammam market-a thla tina hmarcha hlut zawng, ARIMA, ARCH, ARIMAX, SARIMA leh GARCH hmanga chhutchhuah leh market dinhmun a zirin a danglam thei hle bawk.

## 1.2 India rama hmarcha chin uarna hmunte



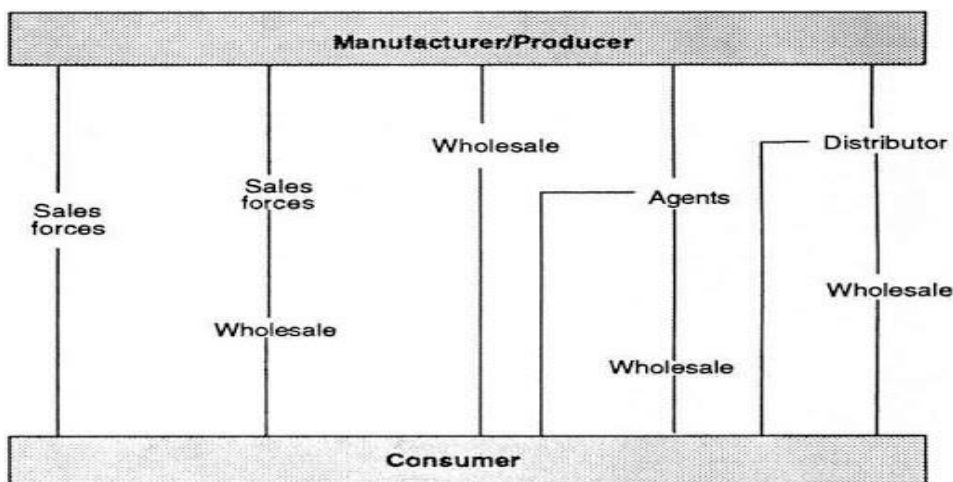
### 1.3 Hmarcha sawngbawlina atanga Mizoaramin hlawkna a hmuhte

Mizoram hian kum 2018 chhung khan hmarcha atangin cheng maktaduai 873 an lalut anga chhut ani a. Heihi kum hmasa lama hmarcha atanga an lak luh aiin a tam a ni. South Asia ramhuam chhunga hmarcha sumdawna atanga sum lalut hnem ber chu Andhra Pradesh niin Telangana in an dawt a ni.

### 1.4 Hmarchaa sumdawna hmasawna daltu

India rama hmarcha thar chhuah hi tam hle mahse a sawngbawlina hmanrua leh dahthatna hmun a awm that loh avangin tamtak chu an riral a. Tharchhuah laia buaina mai bakah, an thil siam chhuahsa fakna tur leh a awmzat awlsam taka hriat leh dahthatna awmlo hian harsatna nasa tak a siambelh a. Hmarcha sumdawna hi ramchhung leh pawna thil man chevel mai bakah khawvel ram insumdawn tawna hian a nghawng nasa hle a ni. Hmarcha dah thatna hmun, bungraw packna tha leh thil siam chhuahsa sem zung zungna a awm loh vang hian India rama hmarcha sawngbalna hian hma a sawn mawh hle a. Sik leh sa inthlak, a chi man to, thar chhuah tlem/ hlawklo leh a chi tha lei mai tur awm lo te hi hmarcha ching tute harsatna lian tak an ni. Hmarcha thar chhuah zat tur hriat leh a man zat tur bituk a harsat vang hian hmarcha chingtuten sumdawna lamah harsatna an tawk nasa hle baw k a. India rama hmarcha lama sumdangtute harsatna tawh dangte chu a chingtute damdawi hman (hlo tur, rannung thatna hlo etc) an thil siamchhuaha la Chambang leh a lei tu tur te a zira a thak dan tur tawk hriat te hi a ni baw k a. A lei tu tur te duh dan ang taka thak tha a kan siam theih chuan hmarcha man in a san phah beisei a ni.

### India rama Hmarcha sumdawna kalhmangte



Reference: FAO

## **1.4 Hmarcha sawngbawl pawimawhna**

Hmarcha hi taksa tana chawtha paitu anih avang leh damdawi atan te pawha hman a nih avangin hian Indian rama chawhmeh ah te telh makmawh a ni. Hmarcha sawngbawl a pawimawh nachhan te chu;

- Rei tak a dahthat theih.
- Hmarcha sawngbawl tawh sa heng hmarcha ro, hmarcha dip, pickle leh a dangte hi man man zawkin an tih ral theih a, hmarcha a atanga hlawkna tam zawk hi chu sawngbawl na atang an hmuhchhuah ani.
- A leitu tur teah phurna a pe.
- Sumdawngte tana hlawkna a tihpun mai bakah a leitute pawh an pun belh a ni.
- Inhlawhfakna tur a tipung.

## **1.5 Hmarcha thatna te**

A tlangpui thuin hmarcha in mihringte tana chaw tha a paite hi an tona hmun a zirte, hmarcha chi a zirte leh lawh hun laia an hmin dan a zirin a danglam thei a ni.

**Table 1: Hmarhcha a thatna awm te leh awmzat te:**

<b>Values (Per 100 gms)</b>		
<b>Parameters</b>	<b>Chillies Dry</b>	<b>Chillies Green</b>
Moisture	10.000 gm	85.700 gm
Protein	15.000 gm	2.900 gm
Fat	6.200 gm	0.600 gm
Minerals	6.100 gm	1.000 gm
Fibre	30.200 gm	6.800 gm
Carbohydrates	31.600 gm	3.000 gm
Energy	246.000 K cal	29.000 Kcal
Calcium	160.000 mg	30.000 mg
Phosphorus	370.000 mg	80.000 mg
Iron	2.300 mg	4.400 mg
<b>Vitamins</b>		
Carotene	345.000 µg	175.000 µg
Thiamine	0.930 mg	0.190 mg
Riboflavin	0.430 mg	0.390 mg
Niacin	9.500 mg	0.900 mg
Vitamin C	50.000 mg	111.000 mg
<b>Minerals &amp; Trace Elements</b>		
Sodium	14.000 mg	-
Potassium	530.000 mg	-
Phytin Phosphorus	71.000 mg	7.000 mg
Magnesium	-	272.000 mg
Copper	-	1.400 mg
Manganese	-	1.380 mg
Molybdenum	-	0.070 mg
Zinc	-	1.780 mg
Chromium	-	0.040 mg
Oxalic Acid	-	67.000 mg
<b>Caloric values</b>		
Chilli (Dry)		297
Chilli (Green)		229

**Reference: The National Institute of Nutrition, Hyderabad.**

## CHAPTER-2

### SAWNGBAWLNA LEH SAWNGBAWLNA KHAWL

#### 2.1 Thuhmahruai

Hmarcha hi an sawngbawl hma hian an tifa hmasa a chumi zawhah chuan a mu an thian fai a, nisa ah emaw khawl hmang tihro a ni leh thin. Dip lutuk lova an tih sawm hnuah khawl dangin dip takin an ti sawma, chu chu hrik anih leh vek hnuah mawihnai taka fun a ni thin.

#### 2.2 Hmarcha sawngbawl na atan department hrang hrangte:

Thlai engpawh han sawngbawl vel tur chuan kan thar chhuah pawt a ngai a. Kan thar chhuah tam dan azir leh a that dan a zirin department chi hrang hrang ten a lei tu tur te a thlen theih nan leh a ching tute tana hlawk zawka hralh anih theih nan hna an thawk thin a. Department hrang hrang te chu / heng te hi an ni;

1. Production and Operation: He department hian kan thil siamchhuah turte leh siamchhuah hun turte uluk takin an ngaihtuah fel thin.
2. Quality Assurance and Regulatory: Kan thil siamchhuah te chu a quality that leh that loh enfel a, certificate (FSSAI, FSSC 22000, Agmark, BRC etc.) neih na tur a hmalak, chaw thianghlim leh fai siam chhuahna kawnga theihtawp chhuah leh hetiang lam kawnga dan awm tawh sa te tha taka zawm hi an tum ber a ni.
3. Research and Development: Thil thar siam chhuah kawngah hma an la thin.
4. Engineering
  - a. Project thar tur ngaihven leh enkawl.
  - b. Khawl thil, building, kawng etc, uluk taka enkawl.
  - c. Tui chhe paihna leh tihfaina uluk taka enkawl.
  - d. Power supplyna chi hrang hrang (UPS, Generators, Solar panels, leh sawrkar electric dept nena thawhho na tha neih) uluk taka enkawl.
5. Procurement: Bungraw hman tur chi hrang hrangte lei khawm.
6. Store: Bungraw neih sa te uluk taka ziah fel leh lei ngai turte lo hriat zung zung.
7. Logistic and Supply Chain: Bungraw lei turte an mamawh hun taka pek. Deals and Marketing: Sumdawna lam kaihnhaih thil te ulak taka enfel leh a leitu turte rilru sukthlek a zira thil siamchhuah (product) thar neih.
8. Safety Health and Environment (SHE): Hnathawk tute himna te, hnathawhna hmun a him tawh leh tawh loh enfel leh Pollution control board nena thawh ho na tha neih.

## 9. Human Resource and Legal

An hnathawh tlangpui:

- Recruitment: Hna lak tur a zira mithiam zawn leh a tawk chauh rawih.
- Medical examination and health card record keeping: Hlawhfa/ mi chhawr turte chu an fit tawk leh tawk loh en nan medical examination neih.
- Contract labour engagement: Hnathawh dan tur kalphung leh hlawh chungchangte felfai taka en fel.
- Attendance and leave policy: Hnathawh turte invawnfel dan tur leh a hun taka hna an thawh theih dan tur te hriattir.
- Training for Roll and contractual labour employees: Training neih dan tur ruahman fel mai bakah training laia record felfai taka ziah.
- Skill matrix: Hnathawh tuten an hna thawh tur thiam taka an thawh theih nana tanpui.

### **2.3 Hmarcha sawngbawlina dan hrang hrang te Hmarcha tih ro dan**

Hmarcha rah hmin tha tak, tawih lo leh rannung eichhiat nilo te chu tih ro an ni thin a. Hmarcha tih ro dan hrang hrang te chu;

- a) **Air drying(Pho ro pangai):** A tlangpui thuin hmarcha hmin tha tak chu nisa ah ni 15-20 chung an pho thin a. Nisa hnuaiia pho hmain hmarcha sen tai hlar te chu "Dipsol" ah chiah thin an ni a. Dipsol hi chemical chi 2 potassium carbonate leh butylated hydroxyanisole bakah , badam tel leh gum acacia in chawhpawlh ani a. Dipsol a han chiah hian hmarcha thakna a vawngtha thei a, hei hi a leitatur te duhtusam pawh a ni reng bawk a ni. Amaherawhchu nisa a phoro hi a thianghlim mawh hle a, hun aduh rei (kar khat) mai bakah pho laia bo thlau te alo awm thin avangin a neitute tan a hlawk lemlo. Solar drier hmangin ni 5 chungin a tihro theih ani.



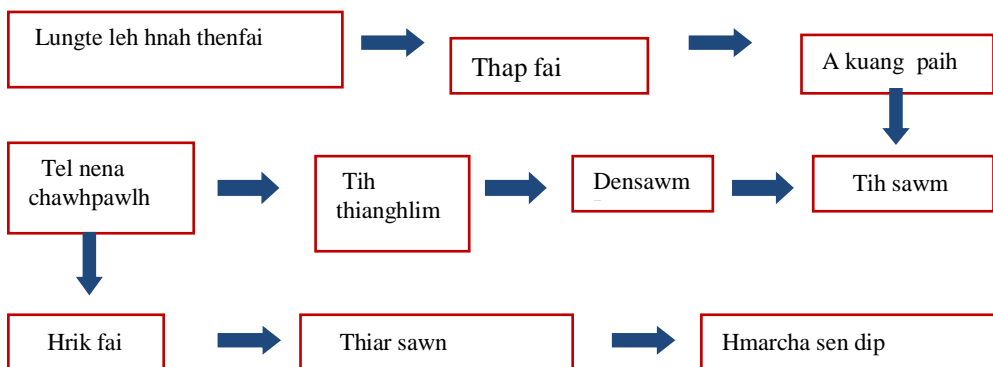
**Nisa a phoro**

- b) **Oven hmang a tih ro:** Kan hmarcha hman azirin a tihro chung hi a inanglo thei hle. Tui ah fai takin hmarcha chu sil phawt tur a ni a. Chumi zawhah hmarcha chu a dung zawnga kan hruk hnu ah ka urna tur trayah kan rem tur a ni. Oven kan on a anga, 100°C velah kan dah phawt ang. Rual khai taka an ro theih nan darker tin kan chawk let tur a ni. Darkar 8 vel 80°C a dah hian hmarcha hi an ro tha tlangpui. Kan hmarcha ur ro sa te hi boruak luh theihlohna bawmah dah in hmun hul leh thim lai deuha dahthat tur a ni.



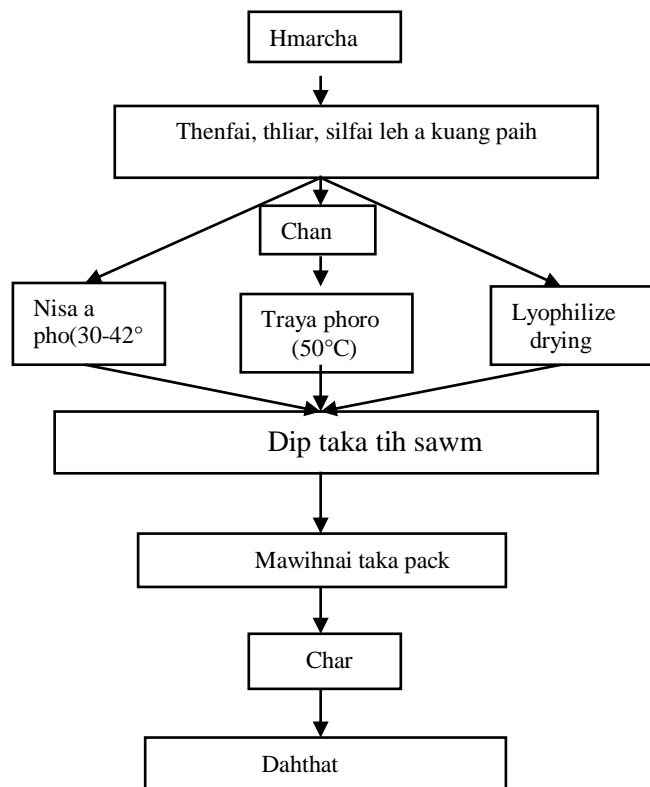
**Oven hmanga hmarcha tih ro**

**Hmarcha sawngbawl dan tlangpui**

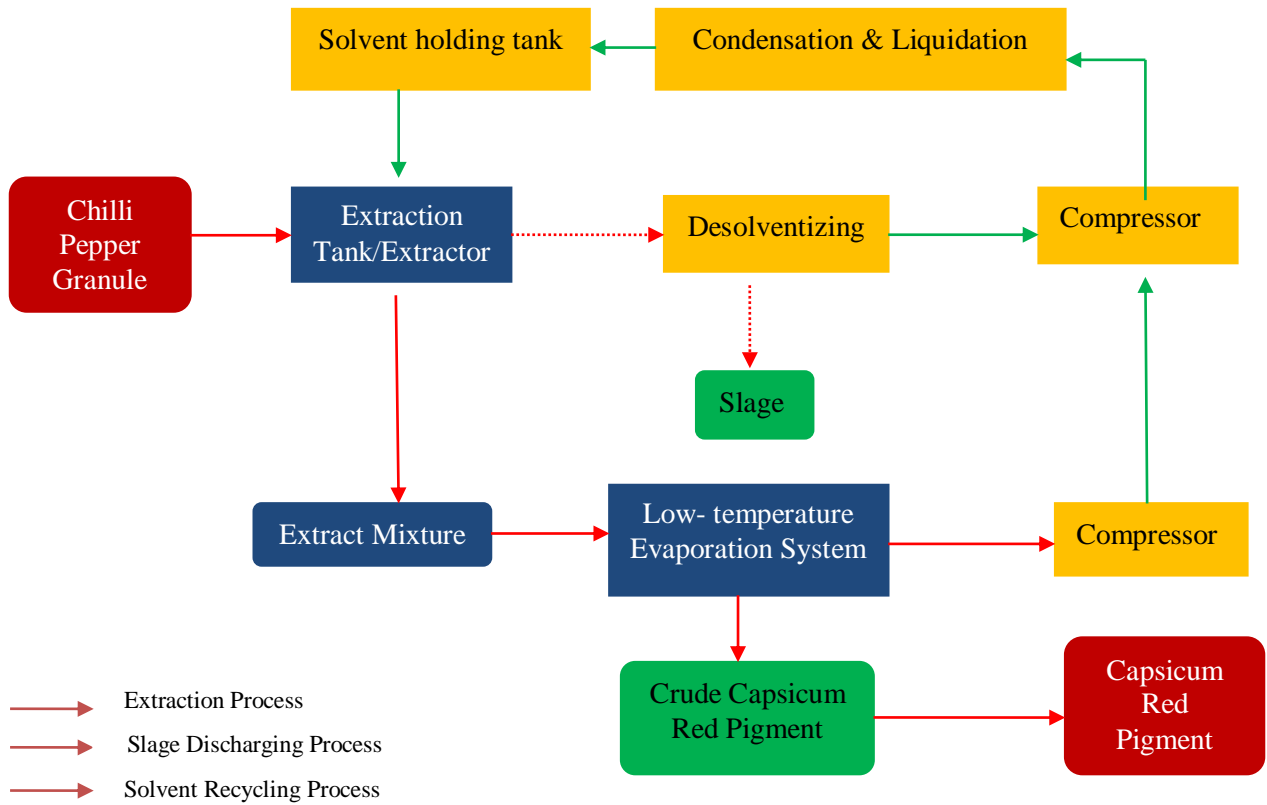


## Hmarcha quality endikna

Hmarcha dip leh a diak (paste) siam tura hmaraw ngaite chu, hmarcha sen tai(*Capsicum annuum*), tui leh tel te anni a. Hmarcha diak siamna khawl ah hian thil hriam tak mai hmarcha chawhna leh chhuan laia tha taka mix theitu a awm a, chumai bakah hmarcha diak ti lum turin a tih lumna khawlah dah tel thin ani bawk. Programmable-Logic-Controller (PLC) Unit hmangin a sat dan tur (temperature) leh a chawh chak zawng (speed) kan enfel thei a. Kan control dan a zirin kan hmarcha diak siam kha kan tidanglam thei a ni. Kan khawl kan tizat tawk loh chuan, a in mix chhung kha a reilo anga hmarcha kha an dip tha thei dawn lova, a tawk chauh a kan tihsat erawh chuan hmarcha kha a in chawh reiin alo dip tha zawk dawn a ni.



## Hmarhcha dip(powder) siam dan



**Flow chart of Capsicum Red Pigment extraction from Red Chilli**



**Capsicum Red Pigment Extraction Machinery (5 tons/day)**

## 2.4 Hmarcha tih ro na khawl

Khawl chhuak thar te hian phoro hunchhung an tih tlem bakah, rual khai takin an tiro thei a chuchuan kan hmarcha phoro quality a ti tha bik a ni. Temperature sang taka hmarcha kan tihro hian hmarcha thatna a tlakhniam tir bakah a hmel a timawilo thei hle. Hmarcha tihro sa te chu hmarcha dipa an siam loh pawhin hetia a puma phoro hian rei tak a dahthat theih a ni.

He khawl milem kan hmuh hian hmarcha a bawhlawh kai mai bakah a hnahte, lei nawi leh thildangte tui a fai taka kan sil ang main alo chhem faia. Heng bawhlawhte tihfai nan hian thli hman niin tui a duh tawka faia kan sil ang tho hian bawhlawh te hi fai takin a paih thei vek a, heihian rang taka hmarcha phorona kawngah a pui hle a ni.



**Hmarcha tihro na khawl**

## 2.5 Hmarcha mu paihfai na

He khawl kan hmuh hian hmarcha chu lo chan sawmin thli chak tak hmangin a mu alo thliar hrang a. Hmarcha mu awm zawng zawng alo paihfai vek thin a ni. Hmarchate mai bakah hmarcha dang chi hrang hrang ah a hman theih vek bawk. He khawl hi a tangkai em em a, darker khat chhungin hamrcha kg 400- 1000 vel a tifai hman a ngaih a ni.



**Hmarcha mu paihfaina khawl**

## 2.6 Hmarcha phoro

Hmarcha kan sawngbawl turah hnawng a tam lutuk chuan duh angin a sawngbawl theih dawn loh a chuvang chuan tha taka kan tihro hmasak a ngai a ni. Tha taka kan tihro hnuah chuan rei tak a dahthat theih a chu mai bakah khawl hmanga her leh dawn pawhin a awlsam bik a ni. He khawlah hian hmarcha chu belt (khawl hmanga tawlh thei) ah da niin hei hian boruak lum hmangin hmarcha chu rualkhai takin a tiro ta thin a ni.



**Chilli Dryer Machine**

## 2.7 Hmarcha her dipna leh hrikna khawl

He khawl hian hmarcha a sawngbawl na thei a chu mai bakah a thlifimin boruak hmangin bawhlawh a paih fai nghal thei bawk. Uluk taka siam niin, hman a awlsam a, thawktu a mamawh tam lova, diesel/ power a heh lo hle bawk a ni.

- a. Sawngbawltu khawl – He khawl hi hmuh hnih a then niin a hraw deuh leh dip tha taka her tu a awm a. Hmarcha her tur chu khawl hmanga chan sawm an ni a, he khawl hi temperature sang taka dah pawhin hmarcha dip rawng a dan phah lo a ni.
- b. Tihfaina/ thlit fimna khawl- Quantitative screw transport an tih mai hmangin a kal chak zawng hi tih danglam theih ani a. Tuboh ang maia thil chhutu he khawlah hian a awm tel a hmarch kan tih dip tur chu he tuboh hian alo chhu tlah tlah thin a ni. Chumi zawhah chuan alo thlifim tu tur khawlah kan hmarcha rawt sa chu in barh lut lehin chuta tanga lo chhuak leh chu kan duh anga alo dip loh chuan a her dipna khawl ah khan va barh luh leh mai tur ani.
- c. Bawhlawh khawn khawm tu khawl- Hmarcha kan her dip hnu a duhthu sam lo lai te he khawl hian alo paih fai leh thin a. Hetia bawhlawh paihfai mai bakah hian hmarcha rimna lutuk tur pawh ati ziawm ve bawk.



**Hmarcha dip hrikna khawl**

## **2.8 Packing**

Kan hmarcha her dip sa te chu kan duh anga rit in he DCS khawl hian lo then hrangin, lo buk nghal mai bakah a pack nghal thei a. Hmarcha mai ni lo heng maida leh eng ilo her dipna hmunah hian an hmang tangkai thin hle a ni. He khawlah hian two-fold screw transport leh mono screw transport awm a. Mono screw ho hi hmun lian vak lo ah an hmang tlangpui a twofold screw zawk erawh hi chu hmun lian zawk ah an hmang thin thung. He khawl hian regulator tha tak hmangin dik ta maiin alo buk a, a khawl hi hman awlsam bakah a tlo em em bawk a ni. Kan thil pack sa lo thui zel theitu puanthui khawl a awm tel bawk avangin hnathawh a ti awlsam hle bawk.



**Semi-auto Packing Machine**

## **2.9 Hmarcha sawngbawl sa endiknate**

Hmarcha sawngbawl sa rawng alo dak/danglam nachhan ber chu sik leh sa (temperature), hmun hnawng a dah, boruak, eng (light) vang te ani tlangpui a. Kan hmarcha dahthat a hnawng lo awm hian hetiang rawng inthlak hi a siam nasa ber a ni. Lei hnawng hnaih a kan dah chuan kan hmarcha dahthat chu a rawng alo da anga nisa emaw hmunsalaia kan dah erawh chuan alo uk dawn thung ani. Hmun hnawnga dah hian ti hmuar hma hle bawk.

Hmarcha dip hi hmun vawt, hnawng leh eng awm lohna hmunah kan dah tur ani a. A theih hram chuan a hmuar tur lakah leh rannung eichhe theitu lakah kan venghim tur a ni a, sazu awm lohna hmunah kan dah bawk tur a ni.

## **Quality endikna atana test chi hrang hrangte hman thin te:**

### **1) Moisture test:**

Hmarcha kan dahthat turte hi rei tak kan dah that theih nan leh a eichhe tu natna laka kan venghim theih nan tha taka tihro tur a ni a. Kan hmarcha chu an ro tha nge thalo kan dahthat hmain Moisture test hmangin kan endik thei a ni. He moisture test kan tihah hian oven hmangin kan endik dawn a.

Hmarcha 5g chu buk anih hnuaah oven ah kan dah ro ang. Oven ah chuan darkar 16 chhung  $100 \pm 1^\circ \text{C}$  ah kan dah anga chu chu kan dah daih leh hnuin a ro chu tha taka buk leh tur a ni. Moisture content chu a hnuaia formula hmang hian kan chhut chhuak thei ang:

$$\text{Moisture content (\%)} = w_1 - w_2/w_3 \times 100$$

$w_1$  = a tira hmarcha rih zawng (g),  $w_2$  = ur hnua hmarcha rih zawng(g),  $w_3$  = hmarcha ro rih zawng (g) Hmarcha a hnawng (moisture) lam chu Indian standard milin 11.0% ani tur a ni.

### **2) Ash test**

#### **Muffle furnace method hmanga endik thin a ni.**

Hmarcha 5g chu crucible ( $600^\circ\text{C}$  a tihsat hnua dah daih leh) ah dah an ni a. Tichuan crucible chu clay pipe triangle a dah anih hnuaah mei sa lutuk lo a hliau ani a, hetah hian kan hmarcha dah chu alo kang ral vek dawn a ni. Hemi zawhah hian muffle furnace an tih ah chuan darkar 3-5 chhung  $600^\circ\text{C}$  ah hem leh tur ani. Chumi zawhah chuan kan la chhuak leh ang a kan buk leh ang. Mei vap chu he formula hmang hian chhut chhuah tur a ni.

$$\text{Total ash (\%)} = w_1/w_2 \times 100$$

$w_1$  = mei vap rih zawng (g),  $w_2$  = Hmarcha rih zawng (g)

Hmarcha dip ash content chu Indian Standard milin 8.0% ani turin.

### **3) Acid insoluble ash content**

HCl pawlh dal tawh chu 25ml la in bowl a hmarcha vap(ash) awm naah kan leih lut tur ani a, chu chu kan chhuang so leh tur a ni. Kan chhuan sa chu kan ti dai ang a tichuan filter paper hmangin kan filter leh tur a ni. HCl chambang zawng zawng a fai hma chu kan filter paper hman

kha kan sil tur ani a, silver nitrate solution a kan test hnuah kan bowl ah kan dah leh tur a ni. Water bath-ah uluk takin kan so ral (evaporate) tir ang a chumi hnuah muffle furnace ah darkar 1 chhung  $550 \pm 25^\circ\text{C}$  ah dah leh tur ani. Dessicator a kan dah daih leh hnuin kan buk leh ang. An rihna inthlauhna hi 0.001gm aia tlem anih hma chu a chung a kan tih ang khian kan ti tha leh zel tur a ni. Indian standard ah chuan hmarcha acid insoluble ash chu 1.3% a ni tur anga ngaih a ni.

#### **4) Volatile fat Content**

Hmarcha a volatile fat hi Soxhlet method hmang hriat theih ani a. Flask ah hmarcha 3g vel kan dah hrang anga, tichuan flaskah chuan N-Hexen kan chhung lut anga chu chu Soxhlet apparatus ah kan chhung leh vek ang. He Soxhlet apparatus hian volatile oil hmarcha in a pai te chu paih fai thin a. N-Hexen chu paih anih leh hnuah hmarcha a thau awm chu chhut leh niin chu ta tang chuan volatile oil a pai chu chhutchhuah leh thin a ni.

A tlangpuiin hmarcha hian volatile oil hi 0.5% vel an pai a. Hei aia tam emaw tlem chu kan sawngbawl dan azirin a awm ve thei bawk.

#### **5) Refractive Index**

Vacuum chhunga light kal chak zawng leh thil danga light kal chak dan inlaichinna hi refractive index kan tih chu a ni a. Engin (light) thil engpawh a paltlang hian, refraction engemaw zat a awm thin a. Eng lokal kha an lo tikawi a, bungrua a zirin an kal kawih dan a inang lo vek bawk. Hei hi hmarcha in tel (oil) a pai chi hrang hrang te enfiah nana hman thin a ni. A tlangpuii thuin Abbe refractometer hi refractive index en nana an hman ber a ni a, hmarcha tui tlemte farin awlsam takin a hriat theih a ni.

#### **6) Natna hrik laka fihlim**

Hmarcha kan sawngbawl laia kan fimkhur loh vang leh kan dah na hmun a hul tawk loh vangin natna hrik hlauhawm tak ten an lo tichhe thei a. Indian Standard ah chuan kan hmarcha dip te hi Salmonella natna hrik lakah an him tur a ni.

### **2.10 Hmarcha packna khawl**

Hmarcha packna atan hian khawl chi hrang hrang hman thin a ni a, Bazar ah hian a tlangpuiin hmarch hi chi hnih a zawrh thin an ni a

1. Hmarcha hring
2. Hmarcha ro

Hmarcha hring leh ro te hi ra pawna thawnchhuah tur chu Thermocol boxes, plastic trays, carton board, buara, plastic trays etcah te an pack tlangpui a. Hmarcha pack nan kan bungraw hmante hi kan thawna tur hmun a hlat dan a zirin uluk tak athlan thin tur a ani a, hmun hla deuh a kan thawn

dawn chuan chhe mai mai thei lo tur kan hmang thin tur a ni.

## Khawl hmante

Hmarcha dip, sauce, pickle, leh a hring pack nan hian khawl chi hrang hrang hman thin a ni a, chungte chu a hnuai milem kan hmun ang te hi an ni hlawm.



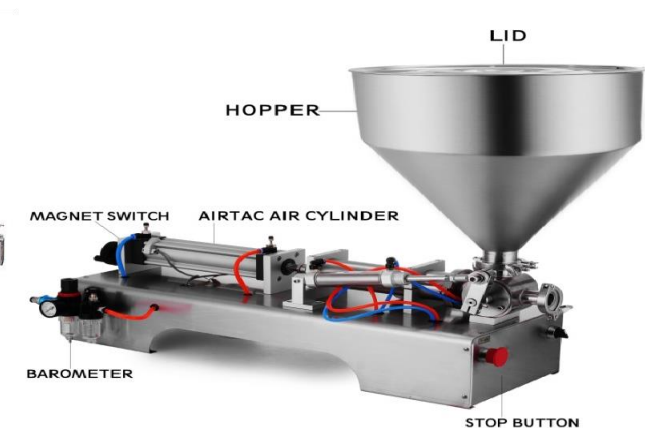
Hmarcha tai packna khawl



Hmarcha hring packna khawl



Hmarcha sauce bottle a thunna khawl



Hmarcha diak packna khawl



Hmarcha sauce packna khawl



Hmarcha dip packna khawl

## 2.11 Mizo Hmarcha Pickle

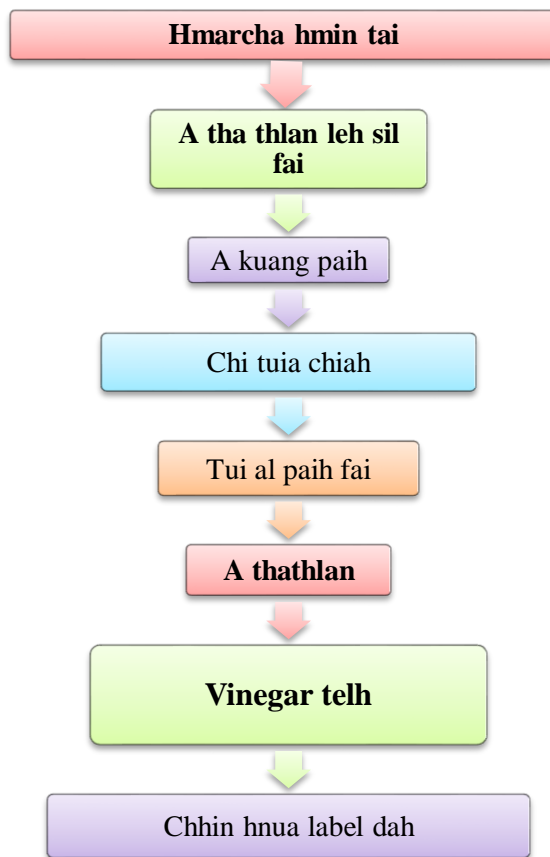
Hmasang ata thali leh theite vawn that nan pickle siam hi hnam hrang hrang in an lo ching tawh thin a. Chaw ei titui tu tha tak anih bakah pumpuia chaw pai tawihna kawngah a pui bawk. Chawhmeh atan a hman an hlawh hle a, a tello a chaw ei thei lo pawh an awm nawk a ni. Pickle te hi thur(acid), chi leh thil dangte pawlh a siam anni thin. Hmarcha sen tai hmang hian pickle chi hrang hrang an siam chhuak thin a, heng zinga lar berte chu tel emaw vinegar hmang a siamte hi an ni.

### Mizo Hmarcha Vinegar Pickle

Fig. 2.7 ah hian mizo hmarcha vinegar pickle siamdan tlangpui a rawn tarlan a ni a. Pickle siam dawn chuan Mizo hmarcha hrisek tak mai chu thlan niin fai taka sil fai hmasak an ni a. Hamrcha silfai sa te chu an kuang an paih leh a chutianga a kuang paih hnu te chu 5% brine solution ah ni 2-3 an chiah leh thin. Pickle siam nan hian chi engpawh a hraw emaw dip emaw a hman theih vek a, mahse kan chi hmanah thil eng eng emaw (chemical lam chi) pawlh anih chuan chu chuan kan pickle siam a tidanglam thei a ni, entirnan iodine chi kan hman chuan kan pickle chu alo dumin a hmel a mawi loh phah thei a ni. Chi Iron telna kan hmang anih chuan kan hmarcha um tur chu ati dum thei bawk. Hei vang hian kan chi hman tur hi kan thlang uluk tur ani a, rei tak kan dahtha duh dawn anih chuan sodium benzoate @ 0.02% hi kan telh thei bawk a ni. Hmarcha brine solution a kan chiah sa chu a tui kan thli anga tichuan hmarcha pum that ha kan thlan chhuak dawn a ni. Tichuan kan hmarcha chu bottle fai takah kan dah anga vinegar 2-5 % kan telh leh ang. Vnegar kan telh tur hi kan thlang uluk tur a ni a, acidity 5 % anei tur ani.

Vinegar hi a fim chauh hman tur ani a, a rawng nei kan hman chuan kan pickle rawng kha a

tidanglam thei a ni. Bottle chu phui taka chin tur a ni a tichuan a kawma label kan bel hnuah kan dahtha thei tawh ang.



**Fig. 2.7 Mizo hmarcha vinegar pickle siamdan**

### Mizo Hmarcha Um

Hmarcha um nan hian thlai atanga siam chhuah tel chi hrang hrang an hmang tlangpui a, thenkhat chuan masala te pawh an telh belh thin bawk. India ramah hian antam tel (Mizoin tel tak kan tih) hi an hmang tlangpui a. Fig. 2.8 hian Mizo hmarcha um siam dan a rawn tarlang a. Mizo hmarcha um siam nan hian hmarcha sen tai hlar mai hi an hmang tlangpui a, hmarcha chu fai taka sil hmasak tur a ni. Tichuan a kuang te thenfai leh hnu in 5% brine solution ah ni 2-3 chhung chiah leh phawt tur a ni. Rei tak chhung dah that tur anih chuan sodium benzoate @ 0.02% hi telh tur a ni bawk. Hmarcha chiah sa chu a tui bunchhuah hnuah bawlhlo chi hrang hrang (aieng, antam chi leh masala dangte) leh tel nen kan chawlpawlh leh tur a ni. Heng bawlhlo kan hman te hi hmuar leh rannung tello, fai tak an ni tur a ni a, hmarcha a kan telh hma hian kan ro emaw tel nena kan theih ani bawk. Tha taka kan chawhpawlh hnuah vinegar leh chi kan telh leh anga chu chu tha taka chawlpawlh leh tur a ni. Kan hmarcha pickle siamsa chu bottle fai takah emaw bur dangah kan dah thei ang. A chhe tur ven nan tel chu kan dahna bur rawng thlengin kan leih leh tur ani a chnumi hnuah chuan bottle chu phui taka chhinin kan dahtha thei tawh a ni.



**Fig. 2.8 Mizohmarcha um siamdan**

## **CHAPTER 3**

### **HMARCHA SAWNGBAWL SA FUNNA LEH CHHINCHHIAHNA**

Eitur fûn na emaw pack na te hian eitur that rei leh dah that kawngah hmun pawimawh tak a luah a. Tunlai Khawvel ah eitûr him dam, hrisel leh tha rei, neih harsa lo, leilung tichhe lo leh la leitu tur tan a awlsam hi mamawhna a sang a, a fûnna hmanrua hian thil awlsam tak a hralh chhuah leh lei a ti awlsam em em a ni. Mizo Hmarcha sawngbawl danglam Hmarcha dip leh Hmarcha pickle te thât rei zâwng hi a fûnna hmanrua hian a hril thui em em a, eng hmanrua nge tha ang tih hre tur chuan eng tê hian nge tichhe thei tih hriat hi a pawimawh hmasa a ni. Heng a hnuai a mi te hi tichhe thei langsar zual te a ni.

#### **3.1 Hmarcha sâwngbawl danglam tichhe thei thil te:**

##### **Boruak hnawn zawng:**

Boruak hnawn zawng emaw hnawng luh leh luh loh hi a pack na hmanrua that leh that loh hrîltu anih bakah Hmarcha dip te that rei leh reiloh a hrîl bawk a, Hmarcha dip te hian hnâwng an pawm em avangin boruak a luh chuan a in hlâwm khâwm thuai a an sâwng tê mai thin a ni. Chu chuan nasa tak in a hlûtna a tlakhniam tîr thin.

##### **A râwng lâr a hloh:**

Mizo hmarcha dip chu en mai a a lo sên vât thin hian a tidanglam em em mai a. Amaherawhchu a fûn na atan sarang fîm emaw lang tlang thei hman hian êng leh Ni sâ ah te a awm rei in a rawng sên chu a ti dal ta thin a ni. Hmarcha pickle ah erawh chuan tha takah pack anih chuan a râwng hi a danglam ve lem lo.

##### **A tûi na leh a rîm hloh:**

Mizo hmarcha danglam leh na chu a rim leh thak that em em na hi ni in, heng te hi amah a oil awm vang a ni a. Hmarcha dip te hi boruak lum lutuk emaw sa lutuk a dah an nih hian a têt (oil) pai hi a hloh thin a, hei hian an rim leh tui na a ti dal in a hlutna a ti tlakhniam thei. Pickle ah erawh chuan a rim leh tui na hi bawhlô dang pawlh vangin a danglam a. A rim leh tui na a hloh mai loh nan uluk tak a pack leh boruak lum lutuk lo ah dah thin tur a ni.

##### **Rannung eichhiat:**

Mizo hmarcha dip hi rannung hian an eichhe duh hle a, hengte hi dah that tawk loh vang a hnâwng leh boruak lut thei a dah thin vang a ni. Pickle ve thung ah erawh chuan rannung eichhiat a awm lo.

##### **Natna hrik in a tihbawlhhlawh:**

Hmun hnâwng the na a 65% leh a chunglam boruak nei ah hian Mizo hmarcha dip hi a lo hnawng ve mai thin a, ro that tâwk loh avang hian reilo te ah hmuar kan tih mai kha alo in siam ta thin a ei atan a tlak loh phah thin. Pickle ah erawh chuan têt leh vinegar kan telh thîn te hian rei tak a vâwng hîm a, a that rei phah 23 mem thin a ni. Amaherawhchu, uluk tak a pack anih loh chuan hmuar chikhat kha alo in

siam a, a that rei tur ang in a tha thên lo.

### **3.2 Mizo Hmarcha dip fûnna hmanrua te:**

Mizo hmarcha dip te chu bawm ro, fai leh phui tha ah pack/fûn tûr a ni. Bâwm te chu palang/glass, thing bâwm, plastic leh eitur dah nan a hîm chin sarang te, hngang atanga siam engpawh a ni thei. Amaherawhchu, bawm chu rîm dang nei emaw rannung lût thei emaw a ni tur a ni lo. Uluk tak leh him tak a chhin phui leh châr phui theih a ni tûr a ni. Kan pack chhan a zirin entîrnan: a tam tham tak emaw, ei khawp lek lek emaw, a tam dan a zir zel in a fûnna hmanrua te hi thlan tur a ni.

#### **A tam tham a pack:**

A tam tham tak a kan pack dawn chuan Flexible Intermediate Bulk Containers (FIBCs), Jumbo bags kan tih mai te hi tunlai a hman uar tak a ni. Hetiang bag hian tonne khat lai a dawng thei a, puan chikhat a siam thin a ni nâ in tunlai a kan hman chu sa tha ip kan tih mai ang deuh hi ni in, a chhunglam hi plastic emaw sarang sawngbawl danglam hmanga thuah a ni. A chhung a thun luhna kua leh lâkchhuahna tur te, a khâi na lai tur nen a neih nghal vek avang hian hman a remchâng hle bawk.

#### **Jumbo Bags hman thât bikna te:**

- ✓ Hetiang bag hi a zangkhai a, thiar vel na a ti awlsam in a tlawm phah a ni.
- ✓ Bags te hi a thleh tawm mai theih a, a tlo hle bawk.
- ✓ A phui that avangin a dip leh her sawm te pawh a dah ve mai theih a ni.
- ✓ A phui that avang hian tihbuak leh tih liam a veng a, tullo a tih riral a veng.
- ✓ Ken vel a remchan avang hian midang chhawr man a ngaih tlem phah bawk.
- ✓ Thiar luh leh chhuah a awlsam in hun a heh lo.

#### **Institutional Packaging emaw mimal tam tham a mamawh te tan**

Institutional packaging kan tih hian Kg2 atanga Kg10 thleng pawn a ni thei a. Tun hma chuan tin emaw thir bawm emaw buara ip anga dah thên a ni, tun hnu ah erawh chuan ip thleh theih sarang a thuah, tih phui leh mai theih te leh sa tha ip puan ang a siamin kan lo thlak ta a. Hetiang ip Biaxially oriented polypropylene (BOPP) an tih hi tha tak a thuah a ni a rawng chi hrang hrang siam a ni, tin, ip te hi a chhung a awm tam lam a zirin a puar mai thin a boruak a chhuah ve mai thin avangin a tangkai in thil pack na tha tak a ni.

#### **Hralh chhuah tur a pack:**

Hetieng hi Consumer packaging kan ti mai a ram chhung emaw ram pawn thleng a thawn chhuah

pawh a huam tel. A pack na tur a hman tur dik tak hre turin heng a hnuai a mi te hi hriat tur pawimawh te a ni:

- Vawng him tha rei thei
- Lo dah lâwkna tur hmun, thawn chhuah na leh semchhuah na thleng a khaw awm dan chinchang.
- A zawrhna tur hmun leh leitur tam na a zirin.
- A leitû tur te duhzawng.
- A kâwm a lem chûang leh in ziak te mit la thei tur leh ngaihthat thlak a ni tur a ni.

### **Zawrh chhuah tur a pack na chi hrang te:**

- Glass bottle len zawng inanglo tak tak chi hrang hrang, a chhin na plastic leh thîr te hman a ni a. Plastic chhin te hi lo hawn rûk emaw tihchîngpen emaw hriat awlsam tak tur a siam thin a ni..
- Tinsplate tîn kan tih mai te hi thenkhat ah chuan a bun chhuahna tur pawh hawn theih siam tel thin a ni.
- Composite containers kan tih mai lehkha khawng emaw bur hmanrua dang dang hmang a siam chhin nei a siam te an ni.
- Plastic bur a kheuh hawna tur emaw a chhin atanga bun chhuah mai theih, lo khawih danglam leh tihchingpen hriat awlsam tak a siam a ni bawk.
- Bag te emaw ip te reuh te ang a siam chi a kawm mawi tak a thlalak nen a dah – boruak thianghlim nen a puar a ip ang a char phui (pillow pouch), boruak chhuahna tur nei leh hawna tur nei sa (gusset pouch) leh sarang emaw tha tak a hawn leh khar leh mai thei a siam ip( stand-up pouch).
- Bawm râng kan tih ang chi uluk tak a thuah that.

Pouch kan tih ip ang a siam, sarang tha chi leh a bawm siam dan pian a zir a tih danglam ho hi tunlai a hman uar tak ani a, a chhan chu siam a awlsam in a tlawm a, a vawng him a, a kâwr ah duh dan rawng leh milem leh a chung a awm a chhut kai mai a awlsam a, a zângkhai in thawn kual a awlsam em em hi a ni. Chu mai bakah chuan kan hman duh dan leh mamawh dan a zirin a siam dan leh a in thuah dan hi duh dan in a thlak danglam ve theih bawk a ni.

Hetiang ip leh bawm te hi a chung a thuah dan a zirin chi hrang hrang a awm ve leh a. A thuah na tur hmanrua hman tlangpui te chu:

- Polyester/ metallised polyester/LDPE
- BOPP/LDPE
- BOPP/ metallised polyester/LDPE
- Polyester/Al foil/LDPE

3ply laminates (pathum a thuah) 12µ PET/ Print/ 12µ Met. PET/ PE te hian a a tlangpui thu in a

kawr diklo hman emaw bawlhhlawh lut leh thil chhut sual a ti tlem a. Polyester leh BOPP hmang a thuah te hi hmuihmer - rim na fûn nan hman uar tak a ni, an mahni hian hetiang rim nei chi bik fûn nan hian that na bik riau a neih a vang a ni.

**Table 3.1 Packaging specifications for flexible packages of ground consumer spices**

<b>Co-extruded films (up to 500 grams capacity)</b>	<b>Laminates/Co-extruded films (up to 1000 grams capacity)</b>
12µ PET / 37.5µ LD-HD (30% HD)	12µ PET/50µ LD-HD (30% HD)
12µ MET PET / 37.5µ LD-HD (30% HD)	12µ MET PET / 50µ LD-HD (30% HD)
12µ PET / 50µ PP	12µ PET / 62.5µ PP
12µ MET PET / 50µ PP	12µ MET PET / 62.5µ PP
10µ PET / 9µ Al. foil / 37.5µ LD-HD (30% HD)	10µ PET / 9µ Al. foil / 50µ LD-HD (30% HD)
12µ Al. foil / 37.5µ LD-HD (30% HD)	12µ Al. foil / 50µ LD-HD (30% HD)
25µ BOPP / 37.5µ LD-HD (30% HD)	25µ BOPP / 50µ LD-HD (30% HD)
25µ MET BOPP / 37.5µ LD-HD (30% HD)	25µ MET BOPP / 50µ LD-HD (30% HD)
35µ BOPP / 25µ BOPP	35µ BOPP / 35µ BOPP
30µ LD – 7.5µ Tie - 25µ PA – 7.5µ Tie - 30µ LD-HD (30% HD)	30µ LD – 7.5µ Tie - 30µ PA – 7.5µ Tie - 40µ LD-HD (30% HD)
The LD or LD-HD layer could also be LLD (outer) or LLD-HD (inner or outer) or EAA layer (outer)	The LD or LD-HD layer could also be LLD (outer) or LLD-HD (inner or outer) or EAA layer (outer)

### **3.3 Mizo Hmarcha Pickle pack na chi hrang te:**

Hmarcha pickle dah nan hian glass bur (palang) chhin nei te hi hman tam ber leh duhtusam a ni.

Amaherawhchu chu thiar kual na te a haûtak avang leh dimdawih a ngaih avang hian pickle man hi a lêt dawn in tih sân a ngaih phah thin. Glass bur te hi zawrh chhuah mai tham emaw, a tam tham a pek chhuah nan a hman theih ve ve a ni.

HDPE (High density polyethylene) leh PET(polyethylene terephthalate) bûr ve thung hi chu pickle kg1 leh a ai a tam dah nan hman thin tângpui an ni. HDPE an tih mai bûr hi lang tâng theilo, hman awlsam leh keh har chi a ni a. PET ve thung erawh hi chu a him a, a lang tlang thei in, a ti lang îtawm thei hle. PC (polycarbonate) bottle emaw bûr te hi pickle dah nân a duhthusam ber ni mahse a la to hle a, hman uar a la nilo a ni.

Tunlai dâwrah ei zawh mai tham a an zawrh ah hi chuan sarâng ip ang chi ah hian zawrh chhuah thin a ni. Hetiang sarângah hi chuan gram200 leh Kg1 thleng in zawrh chhuah thîn a ni. A then chu sarâng khawng tha tak ah târ chhuah mai theih a dah an ni a, a zâng khai in a thianghlim thin hlê. Amaherawhchu, hetiang ip hi châr uluk a ngai hle a, a châr na lai tur alo mâwm emaw anih chuan a phûi mawh tawh thin a ni. Phûi tak leh felfai tak a châr anih loh chuan a tih chhiat hma phah in a tûi hnâi tawh thin lo a ni.

LDPE (low density polyethylene) bûr/ ip te hi a nêem na in boruak lut a veng ve lem lo a. A ip chu a mâwm emaw anih chuan a phui zo tawh thin loh bakah tih phui kim a harsa thin hle. Hêng te avang hian sârang ang chi thuahna nei leh man mân zawk a neih theih pack na te hi pickle dah nân a thlan tam an lo ni ta zâwk a ni. Hetiang a thuahna nei ip ho pianhmang tângpui chu:

- 100 µ HD – LD – HDPE
- 140 µ LD – HDPE
- 110 µ LLDPE – BA – Nylon – BA – LLDPE
- 20 µ BOPP / 50 µ LD – HD (or Cast PP or EAA)
- 12 µ Polyester / 75 µ LD – HD
- 12 µ Metallised Polyester / 100 µ LD – H

## CHAPTER – 4

### FOOD SAFETY REGULATIONS AND STANDARD

#### 4.1 Ei leh in hmanga sumdâwnna Register dan leh License neih dan:

Ram chhunga Ei leh in sumdâwnna leh a kaihnawih zawng zawng te hi ahnuai a inkaihuaina dân leh dun siam te hi an zâwmin, registered (chhinchhiah) a ni tur a ni a, license (phalna) nei an ni bawk tûr a ni.

#### Dan ang a Ei leh In a sumdawnna in register:

- a. Ei leh in tur zawrhna reng reng chuan Registering Authority (thuneitu) te hnenah inhriattir in emaw inziah luh tûr a ni.
- b. An application for registration in Form A Schedule 2 hnuai a tarlan angin in ziah luh dîlna thehlut in Schedule 3 angin pawisa chawi ngai te thehluk tel tûr a ni.
- c. Part I of Schedule 4 in a tarlan angin ei leh in zawrh chhuah rêng rêng te chu a hrisêlin a thianghlim anga, ei atan a him tâwk tur a ni. Dân in a phal chin leh duh dân te a zawm kim ngei a ni tih puan chhuahna Annexure-1 Schedule 2 a inziak chu an thehluk tel bawk tur a ni.
- d. The Registering Authority, phalna pechhuak thei tu te chuan an dîlna te en dik sa anih hnuah phalna a pe thei a, phalsak an nih loh chuan a chhan ziak a chhang lêt in an sumdâwnna an endîk sak tur thu nen a thawnlet tel thîn a ni, a tlângpuiin ennawn sak ngai te chu dîlna thehluk atanga chawlhkar khat chungin en sak an ni ang.
- e. En dik sak ngai tur a tih te chu, Registering Authority ten Part II of Schedule 4 hnuai a ei atan hîm, fai leh thianghlim tâwk ni a a ngaih a tlin chuan ni 30 chungin phalna a pe chhuak leh thei a ni.
- f. Phâlna pêkchhuah loh, hnâwl emaw, sun regulation (3) a târlan angin êndik tur a ni sarih chung a thuchhuah siam loh te emaw sub regulation (4) ang a ni 30 chung engmah chhan letna hmulo te chuan an sîmdawnna chu an chhunzawm thei ang Amaherawhchu, Registering Authority hnuai a Food Business Operator ten siamthat

ngai emaw thil tûl ngai hrang hrang a hnû leh a thuchhuah emaw an hriattir leh anih chuan an zawm tur a ni.

- g. Registration emaw phâlna te hi chhan leh vâng awmlo in hnawl a ni ngawt ngailo a, chhan mumal tak emaw insiamthatna lai tur hrilh emaw an harsatna te ziaak a thehluh phalsak phawt thin an ni
- h. The Registering Authority chuan registration certificate an thlalak chuang emaw photo identity card, dawr chhungah emaw an motor hmanah te an thil zawrhna hmun ah te hmuh mai theih a târ chhuah tur a pe chhuak thin.

## 4.2 Thianghlimna leh inenkawl fai:

### a) Tihfai leh enkawl

- (i) Kan khawl hmante enkawl uluk leh a hunbi chat chat a tihfai thin te kan tihfai tur a zirin a tihfaina damdawi te pawh a hmun a zir zelin hman thin tur a nim
- (ii) Damdawi hmanga hmunhmâ te tihfai hian fimkhur tak leh a hman dân tur duan sa zawmin, a bûr chu thildang nen a hriatpawlh theih loh hman a, hmun himah dah thin tur a ni.
- (iii) Hmarcha ro te hi uluk tak a tihfai hnu ah, thliar hran leh a tihbawlhhlawh thei thil chi hrang hrang a awm leh awmluh endik hnûah dah that thin tûr a ni.
- (iv) Tihfai leh thliar thin hi a ti chhe thei leh tithianghlim lo thei rannung te, kan dahna bur leh hmanrua bal te, leh damdawi emaw hlo li tel thei lak a venhim nan a tangkai hle. Hmuar awm thei lakah te a veng in eitur hriselna vawnvhim kawngah a khat mawi tawk a hmanrua leh eitur tihfai leh then thin hi a pawimawh hle a ni.
- (v) Bungrua leh eitur tihfai emaw then thianghlim reng reng in eitur kan siam emaw kan pack tur te tibawlhhlawh thei thil emaw tihfaina hlo te hman fimkhur a, eitur hnaih lutuk ah hman loh tur.
- (vi) Sanitation program-faina kawng a hmalakna chi hrang hrang te chu a hun leh hmun a zir a thlak danglam thin a, endik thin a ni. A hmun hma lo enlawk emaw khawl hmanga natna hrik leh rannung awm thei te thleng in enfiah thin a ni.
- (vii) Hmun kan phiah a bawlhhlawh nawi boruak a zam kual leh khu kha kan bungrua ah a tla in a leng darh thin a Vacuum cleaner kan tih mai te hi chuan bawlhhlawh kha a hip luh zawk thin avangin hman a tha hle.

### b) Rannung venna:

- (i) Eitur kan dahna emaw siam na te reng reng hi bungrua la tha tak leh phui rannung kan tih kan eitur lo bawm ve thin chi hrang hrang luh theihna a dal tur a ni.
- (ii) In chung a kua reng reng, tui chhe paihna thleng in a him in sazu leh chaichim te luh theih loh tur a siam tur a ni.

(iii) Rannung thahna hli leh tur te pawh hman thin tur a ni. Amaherawhchu, kan hmang anih chuan hman dan tur diktak hriat leh eitur nen a in pawlh thei a hman loh tur a ni. Harsatna a thlen loh nan fimkhur tak a kut lawng a khawih loh tur a ni.

### **Mimal thianghlimna:**

#### **(a) Hriselna chungchang:**

- (i) Hrileng inkaichhawn theih natna nei reng reng eitur siamna hmunah an thawk tur a nilo.
- (ii) Hnathawk tur a rawih tur te reng reng chu an chhawr tan hma in an hriselna endik hmasak tur a ni.
- (iii) Hnathawk tur a chhawr leh a siamna hmun a thawk rêng reng chu kum khatah vawikhat tal an hriselna endik sak a natna kaichhawn theih emaw natna benvawn leh pum lam natna a kai leh kailo en thin tur an ni.

### **Mimal inenkawl thianghlim:**

- (i) Eitur buaipui a khawih tu reng reng chuan kutkawr (glove) leh thawmhnaw thianghlim leh pheikhawk fai an inbel tur a ni.
- (ii) Mahni in enkawl uluk leh invawng fai tak a ni tur a ni a, ei siamna hmun a an luh dawn ah leh inthiar na an hman zawh kut fai takin an sil ngei ngei tur a ni.
- (iii) An sam leh kut tin te a fai em tih endiktu in a endik fo bawk tur a ni.
- (iv) Inneihna zungbun te anih ngawt loh chuan tlereuh inbel chi reng an inbel chuan a khuh bo theih tur thuamhnaw an inbel tur a ni
- (v) Hnathawk tu mei zu, thil thial, hnahchhiau, khuh, thak nei leh chi dang dang nei te chu eitur sawngbawl laiin an tel tur a ni lo.

## **4.3 A funna leh chhinchhiaha:**

Hmarcha ah hian a fûnna te hian pawimawhna a ngah em em a. A fûn khâwmna ni mailo in a thawn chhuah leh zawrh chhuahna ah a him na a ni bawk. FSS Act leh Regulations dan in a sawi ang a dahna siam te hian a bawlhhlawh tûr a vêng a, ei a tan a thianghlim tawk thin a ni. Eitur dah nan a him chin an tih ang ah chauh ei phûng te chu dah thi tur a ni. Hmarcha uluk taka fûn te hian a venghim in dahthat a awlsam phah mai nilo in a tih îtawm thin avangin a man mân zâwkin a hralh chhuah phah theih a ni. Aluminium, tin leh plastic te hi FSS Regulations in a him tawk â a ngaih chin anih leh nih loh endik fô angai bawk. Eitur dahna te hi hman hma in a tha tawk em tih leh a thianghlim tawk em tih en hmasak fô bawk tur, hetiang him tâwklo a eitur dah hian eitur a tichhe thei a, bawlhhlawh a lûtin eitur a tihthlianghlim loh phah thei a ni.

- A siamtu te hian endikna tha tak a chhia emaw thianghlim tawklo hriatna tur an nei tur

a ni.

- Containers(A pack na tur) te chu hman dâwnah enfiah ngei ngei a duhthusam a ni em, a thianghlim em tih te en a, silfai emaw tihfai pawh in hman hma in uluk tak a tleuh a, tih hul that hle thîn tur a ni.
- Kan hman khawp tur emaw hman nghal tur chauh phawrh chhuah thin tur a ni.
- Hmun fai leh thianghlim leh tibawlhhlawh thei thil awmlohna ah chauh eitur te hi pack thin tur a ni.
- Bawm te hi hmanna tur dik tak ah chauh hman thin tur a ni a.Bungraw dang emaw eitur dang lo dah lâwk nan hman thin loh tur a ni.

#### 4.4 Funna atana hman theih bbungrua te

- 1) Mau atanga siam bûr/bâwm
- 2) Thermocol bûr
- 3) Plastic ip
- 4) Net atanga siam bag
- 5) Plastic bawm
- 6) Buara ip



Bamboo board



Plastic Package



Gunny bags



**Plastic box**



**Gunny bags**

#### **4.5 Packna a chhinchhiahna leh code dah**

- i. Hmarcha pack te chu a bawm ah emaw a kâwrah code chhinchhiahna emaw lot number emaw a chhunga awm te hriat mai theihna tur dah thin a ni.
- ii. Coding kan tih mai chhinchhiahna chikhat te hian kan bungrua te a thlen chin, siamna hmun leh hun te chhui a ti awlsam a. Coding hi tih ngei ngei tur tih nilo mahse Section 8.2.1 (Recall Procedure) chuan chhui let a awlsam nan a remchan em avangin hman uar erawh chu tul in a hria a ni.
- iii. Code leh lot number te hi a bâwm emaw a kâwrah reh mai theilo tur a ziah(print) a ni in, hei hian bungrua leh thil siam te - siamna hmun, hmanrua, thawnchhuahna, nî, thla leh kum te a tarlan avangin a pawimawh hle.
- iv. Hmarcha emaw eiphung reng reng a kawrah chhinchhiahna emaw sawifiah na te dah hian ei sual emaw lei sual, huat zawng ei loh tur lo ei palh a veng thei a ni. A chhunga thil awm ziah dik loh te ziah kimloh te a awm hian huat nei (allergy) nei te tan harsatna nasa zâwk a thlen thei a ni. Entirnan: chhawhchhi, badam.

#### **Eitur packed ten a tlem ber ah pawh heng chhinchhiahna leh in ziak te hi an nei tur a ni.**

- a. Name
- b. Name of the product
- c. Net weight
- d. Name and address (manufacturer, packer, distributor, importer, exporter or vendor)
- e. Batch number
- f. Date manufacturing /packing
- g. Best before use date
- h. Veg /non-Veg Logo

- i. FSSAI registration number
- j. Ingredient declaration
- k. Nutritional value
- l. Ingredient declaration
- m. Nutritional value

#### **4.6 Label leh chhinchhiahna dah chungchanga ngaihnhathiam chin te**

Thil fûnna emaw a kâwr chu 100 square centimetre aia a zau lo anih chuan a chhunga bawlhlo leh telh hrang te, lot number, batch number, code number, hman dân, nutritional information te tarlan kher a ngailo. Amaherawhchu, a wholesale packna emaw a pack chhawwna bûr lianah erawh tarlan ngei tur a ni.

- 1) 'Date of manufacture' (siam hun), 'best before date' emaw 'expiry date' (that hun chhung) tih te hi a kâwr 30 square centimetre aia tê-ah chuan tarlan angailo a mahse a lian a pack chhawwna emaw wholesale pack na ah chuan tarlan ngei bawk tur a ni.
- 2) Eitûr chhe hma ni sarih aia reilo dahthat theih loh ang chî-ah chuan 'date of manufacture' (siam ni leh thla) chu tarlang khêr loh in 'use by date' (ei atan a him chhung) chu a kâwr-ah tarlan thin tur a ni.
- 3) A pack-na tê tak te te thun chhawn leh ngai ah chuan bawlhlo telh te, nutritional information, siam nî, thla leh kum-te, that hun chhung, expiry date leh vegetarian logo/non vegetarian logo (sa leh thlai atang a siam hriat hranna) te tarlan tel kher a ngai lo.

#### **4.7 Siam chhuah ni emaw pack ni**

- Kan thil siamchhuah reng reng ah hian a label tha takin kan bel tur a ni a. A label ah chuan kan siamni, thla leh kum chiang takin kan tarlang tur a ni.
- Heng kan ziah bakah hian a that hun chhung tur “Best before Date” hi thla 3 aia rei anih chuan kan tarlang ngei ngeai bawk tur a ni.
- Kan thil siam chhuah chu thla 3 aia hma a chhe thei anih chuan kan siamni, thla leh kum chu a leitu ten an hmuh theih turin a label ah chiang takin kan tarlang ngei ngei tur a ni bawk.

#### **Best Before and Use by Date:**

- i. kan hman theih hun chhung ni keh thla chu a hnuia tarlan ang hian chiang taka ziah lan thin tur a ni:

“BEST BEFORE..... MONTHS AND YEAR

OR

“BEST BEFORE ..... MONTHS FROM PACKAGING

OR

“BEST BEFORE ..... MONTHS FROM MANUFACTURE

(Note: — a awl lai hi dah khah tur)

- ii Pickle, chutney, sauce, thei, thlai rah, sangha etc ah bur emaw bottle emaw a dah anih chuan ahnuai tarlan ang hian ziah thin tur a ni.

“BEST BEFORE.....DATE/MONTH/YEAR”

OR

“BEST BEFORE..... DAYS FROM PACKAGING”

OR

“BEST BEFORE..... DAYS FROM MANUFACTURE”

**Note:**

- (a) A kar awl te hi dah khah tur
- (b) A thla leh kum chu number in ziah tur a ni
- (c) Kum ziah dawnah a tawp lam digit hnih a hman theih bawk.

- iii Aspartame packet ah ve thung chuan “Best Before date” dah lovin Use by date/recommended last consumption date/expiry date te hi dah zawk tur ani a chu chu pack ni atanga kum 3 aia tam lo tu aa ni.

## 4.8 Documentation and Record Keeping:

Eng pawl mai pawh hian tha taka hna thawk thei tur chuan record fel fai takin an nei thin tur a ni a, hei hian sumdawna kawngah nasa takin a pui thei a ni. Kan bungraw lei chi hrang hrang bakah kan hnathawh dan tlangpui leh chuta sum kan hmanral zatte felfai takin kan aiak thlao thin tur a ni a kan bungraw hralhna a kan pawisa hmuh zat pawh uluk taka ziah fel thin tur a ni bawk. Hetianga felfai taka record that nate chu:

1. Sumdawna kawngah nasa takin a pui.
2. Kan thil siam chhuahte quality tha tak aanih reng theih nan min pui thei.
3. Kan sumdawna atana sum hman ral tawh zat awlsam takin a hriat theih.
4. Kan sum hman ralna hriat awlsam bakah engah nge kan insen ber tih te a hriat theih.
5. Thil siam chhuah nana kan sum sen ral zat a hriat theih.
6. Kan thil siamchhuah te sawrkar duh dang ang taka fail eh thianghliam kan siam theih na kawngah a pui thei.
7. Kan khawl hman zawng zawng the hnathawh that leh that loh awlsam takin a chhui theih.
8. Thubuai alo awm palh hunah pawh fiahna hmanrua tha tak anni thei.
9. Kan thil siamchhuah man bitukna kawngah min pui thei.
10. A hun taka harsatna hmachhawn kawngah min pui thei bawk.

### **Record felfai taka ziah dan**

Ei leh in sawngbawl na hmun neitute hian a tlangpuiin record ziah kawngah hian in anna lai an an nei deuh vek a. Hetiang a hnuaia kan tarlan ang hian record chu ziah thin tur a ni.

- Raw material (thil siam chhuah nan kan bungraw hman) kan hman leh kan lei zat.
- A sawngbawl na atan akan thil hman leh kan lei zat.
- Kan sawngbawl laia kan hnathawh dan tlangpui.
- Kan thil siamchhuah quality.

Kan thil siamchhuah quality that leh that loh kan hriat theih nate chu:

- Kan hmanrau (raw material) leh sawngbawlina te thil kan siam dawn apiang a ngai ang chiah chiah a telh emaw pawlh.
- Thil kan siam chhuah dawn apiangin formula ngai kan hmang tur a ni.
- Kan tih dan phung pangngai hlir kan hmang tur a ni.

Kan thil siamchhuah apiang chu batch number kan pe vek tur a ni a. Chu batch number chu hengah te hian kan record fel tur a ni.:

- Stock control books (kan thil lei apiang ziah felna)
- Processing logbooks (kan siamchhuah dan kalhmang ziah felna)
- Product sales records (kan sem chhuhna leh hralh dan ziahna)

Batch numberkan pek kha a product code nena inmil thlap tur a ni. Hetiag a fel fai taka kan tih hian kan thil siamchhuah a duhthusam lo lai awlsam taka hriat theih niin, kan siam chhuahma hmanrua nge tha lova kan siamchhuah dan zawk tih awlsam takin kan chhui chhuak thei dawn a ni.

## 4.9 Tihfai leh CIP

### Tihfai

Kan hmanraw hman zawng zang te hi fai taka sill eh thin tur a ni a, kan thil saim bangnawi te te leh bawhlhawl lo awmte chu thildang siam leh hmain uluk takin akn thian fai vek tur a ni.

CIP (Clean-in-Place) hi kan khawl hmante phelh darh ngai lova awlsam taka khawl chhung zawng zawng silfaiu a ni a, kan khawl hman a zira danglam thei ni mahse a tihfai thin ho tlangpui te chu: are

- Hnathawhna/hmasawanna kalkawng tih thinghlimna
- Bungbel
- Hmanrua kan hman tlangpuite

CIP Systems pump chuan kan khawl tih faina tur leh tleuhna tur tui lah kan tih thinghlimna tur damdawite chu pipe khat atangin aluan khawm tir vek a, hei hian hmun dang atang lei nawi leh thil bal lo awm theihna lakah a veng tel nghal a ni.

## 4.10 CIP that nate

**4.10.1 Tihsual awm palh thei lakah a veng:** CIP hmang hian automatic a tihfai anih thin avangin mihring tihsual awm palh thei lakah a veng thei.

**4.10.2 Hnathawk tute a venghim:** CIP ah hi chuan khawl chhung vekah tihfai hna hi thawh anih avangin hei hian mihringte chemical hlauhawm (khawl silfai nan hman thin) lakah a humhim a ni.

#### **4.10.3 Hna thawh hun chung a tisei:** Khawl hmante tih fain a atana hun

khawhral a tlem avangin hnathawh hun chung a ti sei.

**4.10.4 Product Quality:** Fai taka kan thil siamna khawlte kan tihfai thin chuan kan thilsiamchhuah te chu natna hlauhawlm leh thil thalo dang lakah an fihlim phah thei a ni.

**4.10.5 Utility Savings:** Tui leh energy kan hmangral tlem bik a ni.

### **4.11 CIP cycle in dawl dan:**

**4.11.1 Pre-rinse** – Kan thilsiamna atanga abangnawi la cham bangte a tihfai bakah chini leh thau te a tleuhfai nghal thin.

**4.11.2 Caustic wash** – Thau la chambang ati nem a chuchuan tihf ai a ti awlsam em em a. Tin, he caustic was hi vawi tamtak a hman theih a ni.

**4.11.3 Intermediate rinse** –CAUstic was zawh akan sahbawn hman la chmabangte hei hian alo thuah fai leh a ni.

**4.11.4 Final rinse** – Hei hian a tawp na uluk takin alo tleuh fai leh am heta tui kan hman hi tleuhfaina hmasa ber pre-was atan hian an hmnag nawn leh thin a ni.

**4.11.5 Sanitizing rinse** – Hei hian natna hrik mita hmuh theih lohte that kawngah a pui hle.

Heng kan sawi bakah hian hmun thenkhatah chuan a hnuai kan tarlan te hi an la ti leh bawk thin a ni.

ø **Push out:** Pre-flush kan tih hmain kan khawla kan thil siamna chamnbangte tihfai na ani a, thil tih faina kawngah a pui hle a ni.

ø **Acid wash:** Tuia kan phuhfai mek laia tih ve theih a ni a, hei hian tui a tih fai theih loh chin a rwn ei fai thin a ni.

ø **Air blow:** Hei hian kan thil siamna khwl kan silfai saa hnawmg lo la chambangte a rawn chhem ro thin a ni. .

## **CHAPTER 5**

### **SUMDAWNG MI INTEL KHAWMTE TANA HAMTHATNA**

#### **5.1. PM-FME Scheme:**

Ministry of Food Processing Industries (MoFPI), leh States tangkawp in an din, "PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)" hian India ram pumpuih sum fai, thlai chin dan tha zawk leh sumdawna lama in khaihruina te hi eitur sawngbawlina neisate than zelna atan an pe thei reng a. He scheme ina tum bulpuite chu:

- I. GST, Udyog Aadhar, FSSAI a inziak lut duh te tanpui bakah an than leh zelna tur atan sum pek;
- II. Thianghlim taka eitur sawngbaw anih theih hetiang lama tui mite training pek;
- III. Bank loan an lak theihna tur atan tanpui leh DPR siam tura puih;
- IV. Thlai chingtu intel khwm leh pawl dang hrang hrang, heng Farmer Producer Organizations (FPOs) leh Self Help Groups (SHGs) te bultana tur atana sum pek, an hmarua turte buaipui sak leh an mahni brand siamna tur atan leh a hralhchhuahna lam puih.