

# MANUAL

## GOOD AGRICULTURAL MARKETING PRACTICES FOR JOWAR



सत्यमेव जयते

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**GOVERNMENT OF INDIA**  
**MINISTRY OF AGRICULTURE**  
**(DEPARTMENT OF AGRICULTURE & COOPERATION)**  
**DIRECTORATE OF MARKETING & INSPECTION**  
**BRANCH HEAD OFFICE**  
**NAGPUR**

## PREFACE

The Inter-Ministerial Task Force on Agricultural Marketing Reforms in their report in May,2002, suggested several measures for undertaking various reforms in the Agricultural Marketing System in the country. In view of the keen competition in the domestic as well as export markets, it has become imperative to launch awareness programmes vigorously to update the technical know-how of various stakeholders involved in the marketing of farm produce in multi dimensional aspects of agricultural marketing system.

In view of the above, an attempt has been made to draft a “**Manual on Good Agricultural Marketing Practices for Jowar**”. This manual covers various aspects of post harvest management and marketing of jowar.

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The usual disclaimer about the responsibility of Government of India as to the facts cited in the manual and views expressed is implied. However, any creative suggestions to bring out further improvement in the manual would be most welcome.

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## GOOD AGRICULTURAL MARKETING PRACTICES FOR JOWAR

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# JOWAR



**Botanical Name:** *Sorghum bicolor* L. Moench

**Family:** Gramineae

## 1.0 INTRODUCTION

Jowar is one of the major food grains of our country. It provides food, feed and fodder in the arid and semi-arid tropics of the world. It is a staple food for poor rural people in Asian and African countries. Jowar is often referred to as “coarse grain”. Though it is a traditional subsistence crop but now changes its role to commercial/semi-commercial crop. It is primarily used as livestock feed and as industrial use in USA and other developed countries. It has also been used in the production of alcohol. The sweet stalked sorghum is emerging as a potential raw material to the industries producing ethanol, jaggery and paper making. The whole plant is used for forage, hay or silage. Jowar is grown in semi-arid climate where other crops donot stand well. The crop withstand in drought condition. It is grown as kharif, rabi and also as summer sorghum.

## 2.0 NUTRITIONAL VALUE

(in 100 gms)

Energy (kcal)	Protein (g)	Carbohydrate (g)	Fat (g)	Ash (g)	Crude fibre (g)	Ca (mg)	Fe (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)
329	10.4	70.7	3.1	1.6	2.0	25	5.4	0.38	0.15	4.3

## 3.0 IMPORTANT VARIETIES GROWN IN INDIA

State	Varieties
Andhra Pradesh	PSV-1(SPV-462),CSH-5,CSH-6,CSH-9, CSH-10, CSH-11, CSH-14,PSH-1, NTJ-2, CSV-14R, M-35-1, Pachcha Jonnalalu,Tella Jonnalalu
Gujarat	BP-53, SURAT-1, GJ-108, BC-9, GJ-3B, GJ-40,GJ-41,GSH-1, CSH-5,CSH-6,CSH-11,GJ-9,GJ-36,GJ-37,GJ-38,CSH-2-13,GFH-4
Karnataka	CSH-5, CSH-10, CSH-12 R, CSH-14, CSV-5,D-340, M-35-1
Maharashtra	CSH-5,CSH-9,CSH-13, CSH-15(R), CSH-16, CSV-12, SPV-475,SPV-946,SPV-504, M-35-1
Orissa	CSH-1, CSH-2,CSH-5, CSV-13,CSV-15, Swarna, Varsha,MFSH-4
Tamil Nadu	CSH-1, CSH-5, CSH-6,CSH-9,CO-10, CO-18,CO-19, CO-20,CO-21, CO-25, CO-26,COH-3, COH-4, K-4 K-5,K-6,K-8,K-10, K-11,K-TALL,PAIYUR-1,PAIYUR-2, BSR-1, APK-1
Uttar Pradesh	CSH-16, CSH-14,CMH-9,CSB-15,CSB-13, VARSHA,Mau T-1,Mau T-2.

## Varieties classification according to their maturity status

Maturity status	Duration (in days)	Hybrid varieties	Improved varieties
<b>KHARIF</b>			
Early	95-105	CSH 1, CSH 6, CSH14, CSH 17	–
Medium	105-110	CSH 5, CSH 9, CSH 10, CSH11, CSH 13, CSH 16, CSH 18	CSV10, CSV 11, CSV 13, CSV 15
Sweet sorghum	118-120	-	SSV 84
<b>RABI</b>			
Early	105-110	-	-
Medium	110-120	CSH 8R, CSH12R, CSH 13 R, CSH 15 R	CSV 8R, CSV 14R, M 35-1

### 4.0 HARVESTING AND POST-HARVEST CARE

#### A) HARVESTING CARE

**The following harvesting care should be taken :**

- ★ Jowar grown for foodgrain should be harvested when it attains physiological maturity.
- ★ Avoid pest infestation during drying and threshing etc.
- ★ Dry earheads sufficiently as moisture content influence keeping quality.
- ★ Dry the jowar grains sufficiently (9 percent) prior to packing and storing.
- ★ Jowar seeds should be dried in diffused sunlight.
- ★ Pack the jowar in jute bags free from infestation and obnoxious smell.
- ★ Avoid harvesting during adverse weather conditions i.e. rains and overcast weather.

## **B) POST-HARVEST CARE**

To minimize post harvest losses, the following measures should be followed.

- ★ The crop should be harvested on attaining physiological maturity.
- ★ The grain should be dried to bring the moisture content below 9 per cent.
- ★ Use infested free packaging material for storage and transport.
- ★ Use proper scientific technique in storage.
- ★ Use pest control measures before storage.
- ★ Provide aeration to stored grain.
- ★ Seed should not be exposed to direct sunlight.
- ★ Seed should be inspected at fortnightly interval.
- ★ Use proper techniques while handling (loading and unloading).

### **5.0 GRADING**

Grading means the sorting of the homogenous lots of the produce according to the fixed grade standards. Produce is graded in accordance with the various quality factors.

#### **Benefits:**

1. The grading of jowar is beneficial to the farmers, traders as well as to the consumers.
2. Grading of the produce before sale enables farmers to get better price for their produce.
3. The grading helps the consumers to get standard quality produce at fair price.
4. After grading, it is easier for the consumer to compare the prices of different qualities of a produce in the market.
5. Grading also reduces the cost of marketing.

#### **Grade specifications:**

##### **i) Grading under AGMARK:**

Grading under Agmark is carried out by the Directorate of Marketing & Inspection in accordance with the grade specifications notified by the Central Government under the provision of Agricultural Produce (Grading and Marking) Act, 1937 and Rules made there-under. The Agmark grade standards for jowar notified under the Act are given in ANNEXURE - I to II.

## ii) Food Corporation of India (FCI):

Food Corporation of India (FCI) is the nodal agency of the Government of India for procuring the foodgrains in different states and jowar is also procured by them. The grade specifications followed during marketing season 2006-2007 are given in ANNEXURE - III.

## iii) CODEX STANDARDS:

**CODEX ALIMENTARIUS COMMISSION (CAC)** : Codex Alimentarius Commission (CAC) implements joint FAO/WHO Food Standards Programme. The purpose of the CAC programme is to protect the health of consumers and ensure fair practices in the food trade. The CAC is a collection of internationally adopted food standards presented in a uniform manner. Sanitary and Phyto-Sanitary Agreement and Technical Barriers to Trade Agreement of World Trade Organization recognizes standards framed by CAC with respect to safety and quality aspects of food items. Thus, for international trade, standards framed by CAC are recognized. Codex standard for sorghum grains are given in ANNEXURE - IV.

## 6.0 PACKAGING

Good packaging is necessary for easy handling, transportation and storage. The jowar is transported from field (threshing floor) to the market and godown in gunny bags. Good quality gunny bags either new or second hand with proper treatment are necessary to avoid spoilage and to protect the jowar from moisture and insect attack etc.

### Qualities of good packaging material :

- ✓ It should be convenient in operations.
- ✓ The packaging material must preserve the quality of produce.
- ✓ It should be convenient to stack.
- ✓ It should be able to prevent spillage during transit and storage.
- ✓ It should be cost-effective.
- ✓ It should be clean and attractive.
- ✓ It should be biodegradable.
- ✓ It should be helpful in reducing the marketing cost by reducing the handling and retailing cost.
- ✓ Packing material should be reusable.

## 7.0 TRANSPORTATION

The following means of transportation are used at different stages of marketing.

<b>Stage of Marketing</b>	<b>Transportation by</b>	<b>Means of Transport</b>
1.From field to the village market or primary market.	<b>Farmer</b>	By Head load, Pack animal, Bullock cart or Tractor's trolley.
2.From primary market to secondary wholesale market and miller	<b>Traders / Millers</b>	By Trucks, Railway wagons.
3.From miller and wholesale markets to retailer	<b>Millers / Retailers</b>	By Mini trucks, Trucks, Railway wagons.
4.From retailer to consumer	<b>Consumer</b>	By Head loads, Pack animal, Bullock / Hand cart, Rickshaw, Auto vehicle.
5.For Export	<b>Exporter/Trader</b>	By Ship, Air Cargo

### Modes of Transport used :

There are different modes of transport used in jowar transportation. Road and Rail transport are normally used for internal markets. The most common modes of transportation are;

**1) Road transportation:** Road transport is the most popular mode for movement of jowar to the assembling markets as well as to the distribution centers. The following means of road transport are used in different parts of the country to transport jowar:

#### a) Bullock carts/camel carts:

##### Benefits:

1. Suitable for small quantity of produce.
2. Cheap and easily available.
3. Easy transport for short distance.
4. Easily manufactured by village artisan.
5. Easily operated on *kaccha* road, muddy or sandy path.

#### b) Tractor trolley:

##### Benefits:

1. Carry larger quantity of produce than bullock carts in less time.
2. Suitable to transport produce in primary assembling markets in the absence of proper *pucca* road connecting the villages and market.
3. Multipurpose use of tractor for farmers.

#### c) Trucks:

The truck is the most convenient means of transport throughout the country for longer distances for bulk quantity.

### **Benefits:**

1. Suitable for long distance.
2. Comparatively easily available.
3. Quick movement.
4. Convenient during loading and unloading.
5. Provide door to door delivery.
6. Safe transport.

**2) Railways:** Railway is one of the most important means of transportation.

### **Benefits:**

1. Suitable for carrying larger quantity of produce.
2. Suitable for long distances through out India.
3. Comparatively cheaper and safer mode of transport.

**3) Water transport:** This is the oldest and cheapest mode of transport. It includes river transport, canal transport and sea transport.

### **Benefits:**

- i) Suitable for carrying large quantity for export and import to other countries.
- ii) Comparatively cheaper mode of transport.

## **8.0 STORAGE**

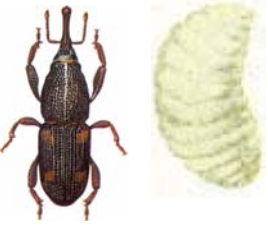




### **Basic requirements for safe and scientific storage:**



The following requirements should be fulfilled for safe storage of jowar:

1. The storage structure should be located on a raised well-drained place and easily accessible.
2. The land of the site should be protected from humidity, excessive heat, direct sun rays, insects and rodents.
3. Storage godown should be constructed on a well-built pucca platform at a height of not less than 1 foot above ground level.
4. The storage structure should be selected according to the quantity of jowar to be stored.
5. In godowns, sufficient space should be provided between two stacks for proper aeration and movement of person for inspection.
6. The storage structures should be properly cleaned before storing jowar. There should be no left over grains, cracks, holes and crevices in the structure.
7. The structure should be fumigated before storage.

8. Before storage, the jowar should be properly cleaned and dried up to optimum moisture level.
9. Jowar seeds should be free from foreign matter, infested seeds to avoid quality deterioration and pest attack.
10. Always use new and dry gunny bags. Disinfect the old gunny bags by boiling in 1 percent Malathion solution for 3-4 minutes and dry it.
11. The new and old stocks should be stored separately to check infestation and maintain hygienic condition of godown.
12. Dunnage should be used before stacking bags to avoid absorption of moisture from floor. Bags should be kept on wooden crates or bamboo mats along with a cover of polythene sheet, preferably.
13. There should be proper aeration during clear weather condition but care should be taken to avoid aeration during rainy season.
14. The vehicles used for transportation of jowar should be cleaned by phenyl to avoid infestation.
15. Regular inspection of stored jowar should be carried out to maintain proper health and hygiene of the stock.

## A) Major stored grain pests of Jowar and their control measures :

Name of pest	Figure of pest	Damage	Control measures
<p><b>1. Rice weevil</b> <i>Sitophilus oryzae</i> (Linn.)</p>	 <p>Adult      Larvae</p>	<p>Adults and larvae both bore into grains and feed on the grain.</p>	<p>Two types of treatments are followed to control infestation.</p> <p><b>A) Prophylactic treatment :</b> Use following insecticide to prevent infestation in godown and stock of jowar.</p>
<p><b>2. Lesser grain borer</b> <i>Rhizopertha dominica</i> (Fabr.)</p>		<p>Beetles and larvae both penetrate the grain and feed. Sometimes, larvae feed on the waste flour produced by the adults. Heavy infestation makes the grain warm and moist, which leads to mould formation.</p>	<p><b>1. Malathion (50 percent EC):</b> Mix 1 litre in 100 litre of water. Use 3 litre prepared solution per 100 square meter area. Spray every 15 days interval.</p>
<p><b>3. Khapra beetle</b> <i>Trogoderma granarium</i></p>	 <p>Beetle      Larvae</p>	<p>Larvae is a very serious stored pest but the beetle itself does not damage. First the larvae feed germ portion and later other parts of the grains.</p>	<p><b>2. DDVP (76 percent EC):</b> Mix 1 litre in 150 litre of water. Use 3 litre prepared solution per 100 square meter area. Do not spray on stock. Spray on walls and floors of the godown as and when required or once in a month.</p>
<p><b>4. Saw-toothed grain beetle</b> <i>Oryzaephilus surinamensis</i> (Linn.)</p>		<p>Both beetle and larvae feed broken grains and damaged grains of other insects. They are usually found as a secondary pest together with other grain pests.</p>	<p><b>3. Deltamethrin (2.5/WP):</b> Mix 1 kg. in 25 litre of water. Use 3 litre prepared solution per 100 square meter area. Spray on gunny bags after 3 months' interval.</p>
<p><b>5. Red rust flour beetle</b> <i>Tribolium castaneum</i> (Herbst.)</p>		<p>Beetle and larvae both do not cause damage to whole grain but feed on broken and damaged grains produced by milling and handling or infested /damaged grains of other insects.</p>	<p><b>B) Curative Treatment :</b> Use following fumigation</p>

<p><b>6. Rice moth</b> <i>Corcyra cephalonica</i></p>		<p>Larvae feed broken and processed jowar. Larvae produce dense webbings. Whole grain kernels are bound into lumps.</p>	<p>insecticide to control infested stock/godown of jowar in airtight condition.</p> <p><b>1. Aluminium phosphide:</b> For stack fumigation use 3 tablets / tonne and put polythene cover on infected stock. For godown fumigation, use 120 to 140 tablets per 100 cubic meter area and keep godown structure airtight and closed for 7 days.</p>
<p><b>7. Rodents</b></p>		<p>Rodents eat whole grains, broken grains, flour etc. They spill more grains than they consume. Rodents also contaminate jowar by hair, urine and feces, which cause diseases like cholera, food poisoning, ringworm, rabies etc. They also damage the storage structures and other accessories of storage like wire and cable etc.</p>	<p><b>Rat cage :</b> Different types of rat cages are available in the market. Caught rats can be killed by dipping into water.</p> <p><b>Poison baits :</b> Anti-coagulant pesticide like Zinc Phosphide is mixed with bread or any other food stuff used as bait. Keep baits for a week.</p> <p><b>Rat burrow fumigation:</b> Put tablets of Aluminum Phosphide in each hole and burrow and block that hole by mud mixture to make it airtight.</p>

**B) Storage structures:**

<p align="center"><b>Traditional Storage structures</b></p>	
<p><b>1. Mud-bin</b></p>	<p>Made by bricks and mud or by straw and cow dung. These are usually cylindrical in shape with varying capacity.</p>
<p><b>1. Bamboo reed bin</b></p>	<p>Made by bamboo splits plastered with mixture of mud and cow dung.</p>
<p><b>3. Thekka</b></p>	<p>These are made up of gunny or cotton cloth wound around wooden support and generally in rectangular shape.</p>
<p><b>4. Metal drums</b></p>	<p>Made up with iron sheets in cylindrical and square shape with various sizes.</p>
<p><b>5. Gunny bags</b></p>	<p>Made up of jute.</p>
<p align="center"><b>Improved storage structures</b></p>	

<b>1. Improved bins</b>	Different organisations developed and designed improved storage structures for scientific storage of food-grains, which are moisture resistant and rodent-proof. These are: a) Pusa Kothi c) Nanda bins e)PKV bins b) PAU bins d) Hapur Kothi f) Chittore stone bins etc.
<b>2. Brick-built godowns</b>	These are made by brick-walls with cemented flooring for storing jowar in bulk and bags.
<b>3. CAP (Cover and Plinth) storage</b>	It is an economical way of storage on a large scale. The plinth is made by cement concrete and bags are stacked in open and covered by ploythene cover.
<b>4. Silos</b>	Silos are used for storage of foodgrains. These are made from concrete, bricks and metallic materials with loading and unloading equipment.

### **C) Storage facilities :**

#### **I) Producer's storage:**

Producers store jowar in bulk at farm godown or in own house using various types of traditional and improved structures. Generally, these storage containers are used for short period. Different organisations/institutions developed improved structures for jowar storage with various capacities like Hapur kothi. Pussa bin, Nanda bin, PKV bin, etc. Other storage structures are also used for this purpose like brick-built rural godown, mud- stone godown etc. Producers also pack jowar in jute gunny bags or in gunny bags lined with polythene and stack in room.

#### **II) Rural Godowns:**

Considering the importance of rural storage in marketing of agricultural produce, the Directorate of Marketing and Inspection initiated a Rural Godowns Scheme, in collaboration with NABARD and NCDL. Its objective is to construct scientific storage godowns with allied facilities in rural areas and to establish a network of rural godowns in the States and Union Territories.

The main objectives of Rural Godowns Scheme are as under:

- i) To prevent distress sale of foodgrains and other agricultural commodities immediately after harvest.
- ii) To reduce quantity and quality losses arising from sub-standard storage.
- iii) To reduce pressure on transport system in the post-harvest period.
- iv) To help the farmers in getting pledge loans against the stored produce.

#### **III) Mandi godowns :**

Most of the jowar is transported to the market after the harvest. Generally, jowar is stored both in bulk and in bags. Most of the states and U.Ts. have enacted Agricultural Produce Marketing Regulation Acts. The APMCs constructed storage godowns in the market yards. At the time of keeping produce in godown, a receipt is issued indicating the kind and weight of produce stored. The receipt is treated as negotiable instrument and is eligible for pledge finance. The CWC and SWCs were also allowed to construct godowns in the market yards. Co-operative societies also constructed godowns in the market yards. Both in

producing and consuming centers/markets, traders also possess permanent storage in the form of godowns or warehouses, or on hire basis.

#### IV ) Central Warehousing Corporation (CWC):

CWC was established during 1957. It is the largest public warehouse operator in the country. In March 2005, CWC was operating 484 warehouses in the country. It has 16 regions, covering 225 districts, with a total storage capacity of 101.86 lakh tones.

#### V ) State Warehousing Corporations (SWCs) :

Different States have set up their own warehouses in the country. The area of operation of the State Warehousing Corporations is district places of the State. The total share capital of the State Warehousing Corporations is contributed equally by the Central Warehousing Corporation and the concerned State Government. The SWCs are under the dual control of the State Government and the CWC. As on 1<sup>st</sup> April 2005, SWCs were operating 1599 warehouses in the country with the total capacity of 195.20 lakh tonnes.

#### VI ) Cooperatives :

Cooperative storage facilities are provided to the producer at cheaper rates, which reduces the storage cost. These cooperatives also provide pledge loan against the produce and storage is more systematic and scientific than traditional storage. Financial assistance and subsidies are provided by Government organisations/banks to build cooperative storage.

To meet the increasing need for storage capacity, the National Cooperative Development Corporation (NCDC) encourages construction of storage facilities by cooperative, particularly at rural and market level.

### 9.0 IMPORTANT ASSEMBLING MARKETS

The following are the important assembling markets in major jowar growing states:

Sl.No.	Name of state	Important markets
1.	Andhra Pradesh	Nizamabad, Armoor, Adilabad, Chennur, Jogipet, Zaheerabad, Mahabubnagar, Badepalli, Suryapet, Miryaguda, Nandyal, Allagadda, Tandur.
2.	Gujarat	Vyara, Uttchal,
3.	Karnataka	Bangalore, Harapanahalli, Gulbarga, Bidar, Basavakalyan, Raichur, Belgaum, Hubli, Gadag, Bijapur, Talikote.
4.	Maharashtra	Jalgaon, Bhusaval, Bodwad, Yawal, Raver, Chopda, Pachora, Chalisgaon, Parola, Amalner, Jamner, Dharamgaon.
5.	Orissa	Gunpur, Rayagada, Umerkote, Tikabali.
6.	Rajasthan	Baran, Bhawani mandi, Jhalra Patan, Kota, Ramganj mandi, Gangapur, Malpura, Kekri, Iklera, Itawa, Nagaur.
7.	Tamilnadu	Dindigul, Perambalur, Namakkal, Coimbatore, Tiruchirapalli, Theni, Vellore, Madurai, Tirunelveli, Salem.
8.	Uttar Pradesh	Meerut, Hapur, Pukhrayan, Orai, Kalpi, Kadaura, Rath, Muspera, mahoba, saharanpur, Muzaffarnagar.

## 10.0 MARKETING CHANNELS

The following are the important marketing channels existing in the marketing of jowar:

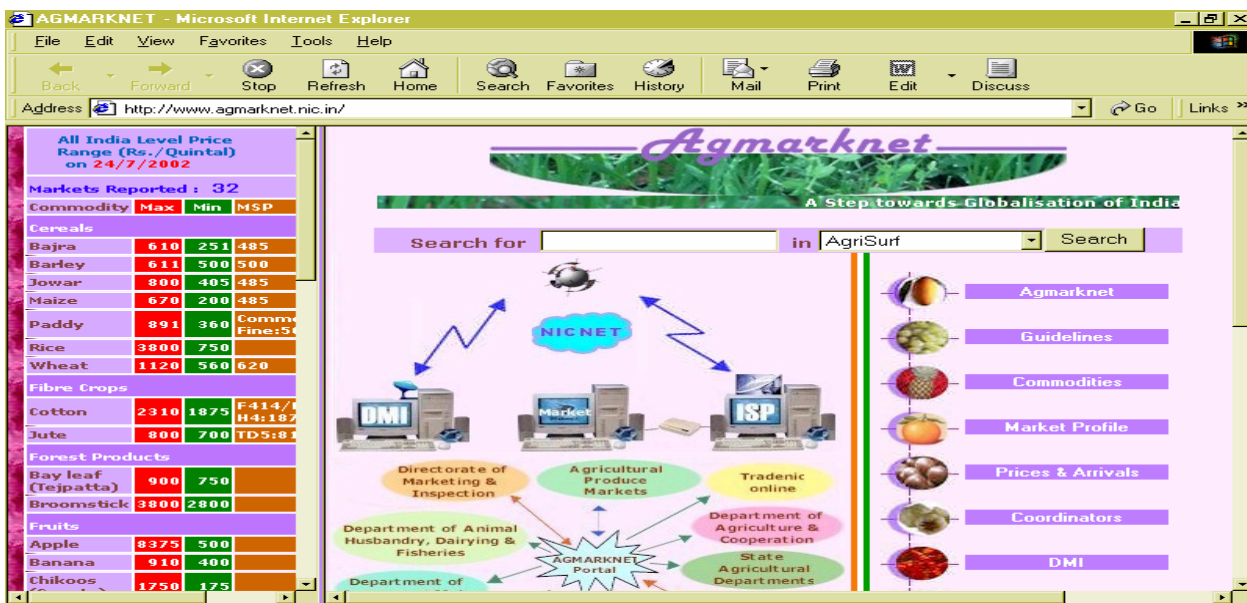
- 1) **Producer** ⇒ **Wholesaler** ⇒ **Retailer** ⇒ **Consumer**
- 2) **Producer** ⇒ **Commission Agent** ⇒ **Wholesaler** ⇒ **Retailer** ⇒ **Consumer**
- 3) **Producer** ⇒ **Commission Agent** ⇒ **Wholesaler** ⇒ **Broker** ⇒ **Processor** ⇒ **Consumer**
- 4) **Producer** ⇒ **Retailer** ⇒ **Consumer**
- 5) **Producer** ⇒ **Consumer**

## 11.0 MARKETING INFORMATION AND EXTENSION

### Marketing information :

Marketing Information is essential for producers in planning production and market led production. It is equally important for other market participants for trading.

Recently, Govt. of India has launched Agricultural Marketing Information Network Scheme through Directorate of Marketing & Inspection (DMI) to bring out improvement in the present market information scenario by linking all Agricultural produce wholesale markets in the States and Union Territories. The data received from markets is being displayed on the website [www.agmarknet.nic.in](http://www.agmarknet.nic.in).



### Marketing extension :

Market extension is a vital factor enlightening the farmers about proper marketing and removal of marketing constraints and improves their awareness in various modern post harvest measures for efficient and cost effective marketability.

### Benefits:

- ★ Provides the up-to-date information on the arrivals and prices of agricultural commodities in different markets.
- ★ Guides the producers to take right decision, when, where and how to market their produce.
- ★ Educate the producers/traders about the post harvest management.
- ★ Orient the producers/traders about prevailing price trends, demand and supply situation etc.
- ★ Provides the information about the sources of credit availability, various Govt. schemes, policies, rules and regulations etc.

### **Kisan Call Centre :**

The Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, Government of India launched Kisan Call Centres on January 21<sup>st</sup>,2004 throughout the country. It has the objective of affording instant solution to the problems faced by the farmers during crop cultivation under diverse challenging situations by using local language. The call centres are acting as composite help centres, which consist of a complex tele-communication infrastructure, computer support and human resources organized to manage effectively and efficiently the queries raised by farmers instantly in local languages. The subject matter specialists using telephone and computer are used to interact with farmers to understand their problems and answer their queries. This is a new dimension in agricultural extension management, which makes the full use of on-going information and communication revolution by connecting the farming community in the remotest areas of the country with the experts in agricultural and allied field. Dial toll free No. 1551 to contact Kisan Call Centre.

## **12.0 ALTERNATIVE SYSTEM OF MARKETING**

### **1.) Direct marketing :**

**Direct marketing is an innovative concept, which involves marketing of produce i.e. jowar by the farmers directly to the consumers/millers without any middlemen. Direct marketing enables producers and flour millers and other bulk buyers to economise on transportation cost and improves price realization. It also provides incentive to large scale marketing companies i.e. flour millers and exporters to purchase directly from producing areas.**

#### **Benefits :**

- ★ Direct marketing helps in better marketing of jowar.
- ★ It increases profit of the producer.
- ★ It minimises marketing cost.
- ★ It encourages distributional efficiency.
- ★ It satisfies the consumer through better quality of produce at reasonable price.
- ★ It provides better marketing techniques to producers.
- ★ It encourages direct contact between producers and consumers.
- ★ It encourages the farmers for retail sale of their produce.

## 2.) Contract marketing :

Contract marketing is a system of marketing in which the commodity is marketed by farmers under a pre-agreed buy-back contract with an agency engaged in trading or processing. In contract marketing, a producer produces crop and deliver to the contractor, a quantum of required quality of produce, based upon anticipated yield and contracted acreage, at a pre-agreed price. Contract marketing ensures continuous supply of quality produce at mutually contracted price to contracting agencies, as well as ensures timely marketing of the produce.

### Benefits :

Benefits	To Producer	To Contracting agency
<b>Risk</b>	It minimises the price risk.	It minimises risk of raw material supply.
<b>Price</b>	Price stability, ensuring fair price.	Price stability as per pre-agreed contract.
<b>Quality</b>	Use of quality seed and inputs.	Get good quality produce and control on quality.
<b>Payment</b>	Assured and regular payments through bank tie up.	Easy handling and better control on payment.
<b>Post-harvest handling</b>	Minimises risk and cost of handling.	Control and efficient handling.
<b>New technology</b>	Facilitates in farm management and practices.	For better and desired produce to meet consumer needs.
<b>Fair trade practices</b>	Minimises malpractices and no involvement of middle man.	Better control on trade practices.
<b>Crop insurance</b>	Reduces risk.	Reduces risk.
<b>Mutual relationship</b>	Strengthens.	Strengthens.
<b>Profit</b>	Increases.	Increases.

## 3.) Cooperative marketing :

Cooperative marketing is the system of marketing in which a group of producers join together and register them under respective State Cooperative Societies Act to market their produce jointly. The members also deal in a number of cooperative marketing activities i.e. processing of produce, grading, packing, storage, transport, finance, etc. The cooperative marketing structure in the different states consists of;

1. **PMS** (Primary Marketing Society) at the Mandi level
2. **SCMF** (State Cooperative Marketing Federation) at the State level
3. **NAFED** (National Agricultural Cooperative Marketing Federation of India Ltd.) at the National Level.

### Benefits :

- ★ Remunerative price to producers.
- ★ Reduction in cost of marketing.
- ★ Reduction in commission charges.
- ★ Effective use of infra-structure.
- ★ Credit facilities.
- ★ Collective processing.

- ★ Easy transportation.
- ★ Reduces malpractices.
- ★ Supply of agricultural inputs.
- ★ Marketing information.

#### 4.) Forward and future markets :

Forward trading means an agreement or a contract between seller and purchaser, for a certain kind and quantity of a commodity for making delivery at a specified future time, at contracted price. It is a type of trading, which provides protection against the price fluctuations of agricultural produce. Producers, traders and millers utilize the future contracts to transfer the price risk. Presently, future markets in the country are regulated through Forward Contracts (Regulation) Act, 1952. The Forward Markets Commission (FMC) performs the functions of advisory, monitoring, supervision and regulation in future and forward trading. Forward trading transactions are performed through exchanges owned by the associations registered under the Act.

#### Benefits :

- 1.) Future trading reduces the price variations.
- 2.) Future trading encourages competition and provides competitive price to farmers, millers or traders.
- 3.) It ensures a balance in demand and supply position throughout the year.
- 4.) Future trading promotes an integrated price structure throughout the country.

### 13.0 INSTITUTIONAL CREDIT FACILITIES

The institutional credit to agriculture is offered in the form of short term, medium term and long term loan through the following agencies –

**A. Commercial Banks (CBs)    B. Regional Rural Banks (RRBs)    C.Co-operatives.**

#### Short term and medium term loans:

Name of scheme	Eligibility	Objective/Facilities
<b>1. Crop Loan</b>	All categories of farmers.	<ul style="list-style-type: none"> <li>➤ To meet cultivation expenses for various crops as short-term loan.</li> <li>➤ This loan is extended in the form of direct finance to farmers with a repayment period not exceeding 18 months.</li> </ul>
<b>2. Produce Marketing Loan</b>	All categories of farmers.	<ul style="list-style-type: none"> <li>➤ This loan is given to help farmers to store produce on their own to avoid distress sale.</li> <li>➤ This loan also facilitates immediate renewal of crop loans for next crop.</li> <li>➤ The repayment period of the loan does not exceed 6</li> </ul>

### 3. Kisan Credit Card Scheme (KCCS)

All agriculture clients having good track record for the last two years.

- months.
- This card provides running account facilities to farmers to meet their production credit and contingency needs.
- The scheme follows simplified procedures to enable the farmers to avail the crop loans as and when they need.
- Minimum credit limit is Rs. 3000/- and this limit is based on operational land holding, cropping pattern and scale of finance.
- Withdrawals can be made by using easy and convenient withdrawal slips. The Kisan Credit Card is valid for 3 years subject to annual review.
- It also covers personal insurance against death or permanent disability for maximum amount of Rs. 50,000 and Rs. 25,000 respectively.

### 4. National Agricultural Insurance Scheme (NAIS)

Scheme is available to all farmers – loanee and non-loanee both-irrespective of the size of their holding.

- To provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crop as a result of natural calamities, pests and diseases attack.
- To encourage the farmers to adopt progressive farming practices, high value in-puts and high technology in agriculture.
- To stabilize farm incomes, particularly in disaster years.
- General Insurance Corporation of India (GIC) is the Implementing Agency.
- Sum insured may extend to the value of threshold yield of the area insured.
- Covers all food crops (cereals, millets and pulses), oilseeds and annual commercial/horticultural crops.
- Provides subsidy of 50 percent in premium of small and marginal farmers. The subsidy will be phased out over a period of 5 years on sunset basis.

### Long term loan

Name of Scheme	Eligibility	Objective/Facilities
<b>Agricultural Term Loan</b>	All categories of farmers (small/medium and agricultural labourers) are eligible, provided they have necessary experience in the activity and required area.	<ul style="list-style-type: none"> <li>➤ The banks extend this loan to farmers to create assets facilitating crop production/income generation.</li> <li>➤ Activities covered under this scheme are land development, minor irrigation, farm mechanization, plantation and horticulture, dairying, poultry, sericulture, dry land / waste land development schemes etc.</li> <li>➤ This loan is offered in the form of direct finance to farmers with a repayment span not less than 3 years and not exceeding 15 years.</li> </ul>

## 14.0 ORGANISATIONS PROVIDING MARKETING SERVICES

Name of the organisation	Services provided
<p><b>1. Directorate of Marketing and Inspection (DMI)</b> NH-4, CGO Complex Faridabad- Website: <a href="http://www.agmarknet.nic.in">www.agmarknet.nic.in</a></p>	<ul style="list-style-type: none"> <li>▶ To integrate development of marketing of agricultural and allied produce in the country.</li> <li>▶ Promotion of grading of agricultural and allied produce.</li> <li>▶ Market development through regulation, planning and designing of physical markets.</li> <li>▶ Construction of rural godowns.</li> <li>▶ Promotion of cold storage.</li> <li>▶ Development of Marketing Infrastructure, Grading &amp; Standardization.</li> <li>▶ Agricultural Marketing Information Network.</li> <li>▶ Training in agricultural marketing.</li> <li>▶ Liaison between the Central and State Governments through its regional offices (11) and sub-offices (25) spread all over the country.</li> </ul>
<p><b>2. Food Corporation of India (FCI),</b> Barakhamba Lane, Cannaught Place, New Delhi-110001 Website:<a href="http://www.fciweb.nic.in">www.fciweb.nic.in</a></p>	<ul style="list-style-type: none"> <li>▶ Procurement of foodgrains for effective price support operations for safeguarding the interests of the farmers.</li> <li>▶ Distribution of foodgrains throughout the country for Public Distribution System.</li> <li>▶ Maintaining satisfactory level of operational/buffer stocks of foodgrains to ensure National Food Security.</li> </ul>
<p><b>3. Central Warehousing Corporation (CWC),</b> 4/1 Siri Institutional Area Opp. Siri Fort New Delhi- 110016 website: <a href="http://www.fieo.com/cwc/">www.fieo.com/cwc/</a></p>	<ul style="list-style-type: none"> <li>▶ Provides scientific storage and handling facilities.</li> <li>▶ Offers consultancy services/ training for the construction of warehousing infrastructure to different agencies.</li> <li>▶ Warehousing facilities extended for import and export of agricultural products.</li> <li>▶ Provides disinfestation services.</li> </ul>
<p><b>4. Agricultural and Processed Food Products Export Development Authority (APEDA),</b> NCUI Building 3, Siri Institutional Area August Kranti Marg, New Delhi 110016 Website: <a href="http://www.apeda.com">www.apeda.com</a></p>	<ul style="list-style-type: none"> <li>▶ Development of industries related to scheduled agriculture products for export.</li> <li>▶ Provides financial assistance to these industries for conducting surveys, feasibility studies, relief and subsidy schemes.</li> <li>▶ Registration of exporters for scheduled products.</li> <li>▶ Fixing of standards and specifications for the purpose of export of scheduled products.</li> <li>▶ Carrying out inspection of meat and meat products for ensuring the quality of such products.</li> <li>▶ Improving the packaging of the scheduled products.</li> <li>▶ Promotion of export oriented production and development of scheduled products.</li> <li>▶ Collection and publication of statistics for improving</li> </ul>

	<p>marketing of scheduled products.</p> <ul style="list-style-type: none"> <li>▶ Training in the various aspects of industries related to the scheduled products.</li> </ul>
<p><b>5.National Co-operative Development Corporation (NCDC),</b> 4, Siri Institutional Area, New Delhi-110016 website: <a href="http://www.ncdc.nic.in">www.ncdc.nic.in</a></p>	<ul style="list-style-type: none"> <li>▶ Planning, promoting and financing programmes for production, processing, marketing, storage, export and import of agricultural produce.</li> <li>▶ Financial support to primary, regional, State and National level co-operative marketing societies is provided towards; <ul style="list-style-type: none"> <li>▶ i))Margin money and working capital finance to augment business operations of agricultural produce.</li> <li>▶ li)Strengthening the share capital base and</li> <li>▶ lii) Purchase of transport vehicles.</li> </ul> </li> </ul>
<p><b>6.Director General of Foreign Trade, (DGFT),</b> Udyog Bhavan, New Delhi. Website: <a href="http://www.nic.in/eximpol">www.nic.in/eximpol</a></p>	<ul style="list-style-type: none"> <li>▶ Provides guidelines / procedure of export and import of various commodities.</li> <li>▶ Allot import-export code number (IEC No) to the exporter and importer of agricultural commodities.</li> </ul>
<p><b>7.State Agricultural Marketing Boards (SAMBs),</b></p>	<ul style="list-style-type: none"> <li>▶ Implementation of the regulation of marketing in the state.</li> <li>▶ Provide infra-structural facilities for the marketing of notified agricultural produce.</li> <li>▶ Provide grading of agricultural produce in the markets.</li> <li>▶ To co-ordinate all the market committees for information services.</li> <li>▶ Provide aid to financially weak or needy market committees in the form of loans and grants.</li> <li>▶ Eliminate malpractices in the marketing system.</li> <li>▶ Arrange or organise seminars, workshops or exhibitions on subjects relating to agricultural marketing and farmers training programme on various aspects of agricultural marketing.</li> <li>▶ Some of the SAMBs are also promoting agro-business.</li> </ul>

## 15.0 DOS AND DON'TS

DOS	DON'TS
✓ Harvest jowar crop when it attains physiological maturity..	✗ Delay in harvesting results decline in vigour and viability.
✓ Harvest during conducive weather condition.	✗ Harvest during adverse weather condition.
✓ Dry the seed properly after harvesting below 9 percent moisture content.	✗ Store before proper drying.
✓ Dry the seed in diffused sunlight in shed open on all sides.	✗ Dry the seed in direct sunlight.
✓ Threshing and winnowing on cemented (pucca) floor.	✗ Perform threshing and winnowing on kuchha floor.
✓ Get the market information from www.agmarknet..nic.in, newspapers, T.V., concerned APMC offices etc before marketing the produce.	✗ Market the produce without collecting information regarding price trend etc.
✓ Store the jowar when the prices are not favourable .	✗ Sell the produce in glut situation.
✓ Take the benefit of contract farming to ensure better price and ready market.	✗ Produce jowar without assessing it's production, demand and price etc.
✓ Use improved post harvest technology to avoid losses.	✗ Use conventional techniques in post harvest operations as it causes losses.
✓ Avail the facility of GRAMIN BHANDARAN YOJNA (Rural Godown Scheme) and store the jowar in scientific way to avoid losses.	✗ Store jowar in un-scientific way as it causes losses.
✓ Select the cheapest and convenient mode of transportation.	✗ Select any mode of transport, which causes losses.
✓ Package properly to protect the quality and quantity of produce during transit and storage.	✗ Use improper package which causes losses during transit and storage.

## ANNEXURE – I

### I] AGMARK grade specification and definition of quality of Kharif jowar

#### A) General characteristics :

Jowar shall-

- a) be the dried mature grains of Sorghum vulgare pers raised in the kharif season;
- b) be sweet, hard, clean, wholesome, uniform in size, shape, colour and in sound merchantable condition;
- c) be free from added colouring matter, moulds, weevils, obnoxious substances, discolouration, poisonous seeds and all other impurities except to the extent indicated in the schedule;
- d) Uric acid and aflatoxin shall not exceed 100 miligrams and 30 micrograms per kilogram respectively;
- e) be free from rodent hair and excreta;
- f) Comply with the restrictions in regard to pesticides/insecticides residue (Rule 65), poisonous metals (Rule 57), naturally occurring toxic substances (Rule 57-B) and other provisions prescribed under the Prevention of Food Adulteration Rules, 1955 and as amended from time to time.

- 
- Note (i) In foreign matter, the impurities of animal origin shall not be more than 0.10 per cent by weight.  
(ii) Ergot affected grains shall not exceed 0.05 per cent by weight in damaged grains.

#### B) Special characteristics :

Grade designation	Maximum limits of tolerance (per cent by weight)						
	Moisture	Foreign matter		Other Edible Grains	Damaged Grains	Immature And shrivelled Grains	Weevilled Grains
		Organic	Inorganic				
Grade I	12.00	0.10	Nil	0.50	1.50	1.00	1.0
Grade II	12.00	0.25	0.10	1.00	3.00	2.00	2.5
Grade III	14.00	0.50	0.25	2.00	4.50	5.00	4.0
Grade IV	14.00	0.75	0.25	3.00	5.00	8.00	5.0

## ANNEXURE - II

### II] AGMARK grade specification and definition of quality of Rabi jowar\_

#### A) General characteristics :

Jowar shall-

- a) be the dried mature grains of Sorghum vulgare pers raised in the Rabi season;
- b) be sweet, hard, clean, wholesome, uniform in size, shape, colour and in sound merchantable condition
- c) be free from added colouring matter, moulds, weevils, obnoxious substances, discolouration, poisonous seeds and all other impurities except to the extent indicated in the schedule;
- d) Uric acid and aflatoxin shall not exceed 100 miligrams and 30 micrograms per kilogram respectively;
- e) be free from rodent hair and excreta;
- f) Comply with the restrictions in regard to pesticides/insecticides residue (Rule 65), poisonous metals (Rule 57), naturally occurring toxic substances (Rule 57-B) and other provisions prescribed under the Prevention of Food Adulteration Rules, 1955 and as amended from time to time.

- 
- Note : (i) In foreign matter, the impurities of animal origin shall not be more than 0.10 per cent by weight.  
(ii) Ergot affected grains shall not exceed 0.05 per cent by weight in damaged grains.

#### B ) Special characteristics :

Grade designation	Maximum limits of tolerance (per cent by weight)						
	Moisture	Foreign matter		Other Edible Grains	Damaged Grains	Immature And shrivelled Grains	Weevilled Grains
		Organic	Inorganic				
Grade I	12.00	0.10	Nil	1.00	1.00	2.0	0.5
Grade II	12.00	0.25	0.10	1.50	2.00	4.0	1.0
Grade III	14.00	0.50	0.25	2.00	3.00	6.0	2.0
Grade IV	14.00	0.75	0.25	4.00	5.00	8.0	6.0

#### C) Definitions :

- (1) "**Foreign matter**" means any extraneous matter than other food grains comprising of
  - (a) "**Inorganic matter**" includes metallic pieces, dust, sand, gravel, stones, dirt, pebbles, lumps or earth, clay, mud and animal filth etc;
  - (b) "**Organic matter**" consisting of husk, straws, weeds and other inedible grains etc.
- (2) "**Other Edible grains**" means any edible grains (including oil seeds) other than the one which is under consideration;
- (3) "**Damaged grains**" means grains that are sprouted or internally damaged as a result of heat, microbe, moisture or weather viz., ergot affected grains and karnal bunt grains;
- (4) "**Immature and shrivelled grains**" means grains that are not properly developed;

- (5) "**Weevilled grains**" means grains that are partially or wholly bored by insects injurious to grains but does not include germ eaten grains and egg spotted grains.
- (6) "**Poisonous, toxic and/or harmful seeds**" means any seed which if present in quantities above permissible limit may have damaging or dangerous effect on health, organoleptic properties or technological performance such as datura (*D.fastuosa* linn and *D. stramonium* linn.) corn coker (Agrostemma githago L. Machai Lallium remulenum linn.) Akra (*Vicia* species).

### ANNEXURE – III

#### **III] FCI uniform specifications for jowar (marketing season 2006-2007)**

The Jowar shall be dried and matured grains of Sorghum vulgare. It shall have uniform size, shape and colour. It shall be in sound merchantable condition and also conforming to PFA standards.

Jowar shall be sweet, hard, clean, wholesome and free from Argemone mexicana and Lathyrus sativus (khesari) in any form, coloring matter, moulds, weevils, obnoxious smell, admixture of deleterious substances and all other impurities except to the extent indicated in the schedule below :

#### **SCHEDULE OF SPECIFICATION**

<b>S.No.</b>	<b>Refractions</b>	<b>Maximum Limits (%)</b>
1.	Foreign matter *	1.0
2.	Other foodgrains	3.0
3.	Damaged grains	1.5
4.	Slightly damaged & discoloured grains	1.0
5.	Shrivelled & Immature grains	4.0
6.	Weevilled grains	1.0
7.	Moisture content	14.0

\*Not more than 0.25% by weight shall be mineral matter and not more than 0.10% by weight shall be impurities of animal origin.

#### **N.B.:**

- The definition of the above refractions and method of analysis are to be followed as given in Bureau of Indian Standard "Method of Analysis for foodgrains" Nos. IS: 4333 (Part-I): 1996 and IS:4333 (Part-II):2002 and "Terminology for foodgrains" IS : 2813-1995 as amended from time to time.
- The method of sampling is to be followed as given in Bureau of Indian Standard "Method of sampling of Cereals and Pulses" No. IS : 14818-2000 as amended from time to time.

3. Within the overall limit of 1.0% for “Foreign Matter” the poisonous seeds shall not exceed 0.5% of which Datura and Akra seeds (*Vicia species*) not to exceed 0.25% and 0.2% respectively.
4. Kernels with glumes will not be treated as unsound grains. During physical analysis the glumes will be removed and treated as organic foreign matter.

## ANNEXURE - IV

### IV] CODEX STANDARD FOR SORGHUM GRAINS

#### **CODEX STAN 172-1989 (Rev. 1 - 1995)**

The Annex to this standard contains provisions which are not intended to be applied within the meaning of the acceptance provisions of Section 4.A (I)(b) of the General Principles of the Codex Alimentarius.

#### **1. SCOPE**

This Standard applies to sorghum grains as defined in Section 2, for human consumption; i.e., ready for its intended use as human food, presented in packaged form or sold loose from the package directly to the consumer. It does not apply to other products derived from sorghum grains.

#### **2. DESCRIPTION**

##### **2.1 Definition of the Product**

Sorghum grains are whole or decorticated grains obtained from species of *Sorghum bicolor* (L.) Moench. They may be suitably dried if necessary.

##### **2.1.2 Whole Sorghum Grains**

These are sorghum grains obtained as such after a complete threshing without any further treatment.

##### **2.1.3 Decorticated Sorghum Grains**

These are sorghum grains from which the external casings and whole or parts of the germ have been removed in an appropriate manner, using mechanical treatment.

#### **3. ESSENTIAL COMPOSITION AND QUALITY FACTORS**

##### **3.1 Quality Factors - General**

3.1.1 Sorghum grains shall be safe and suitable for human consumption.

3.1.2 Sorghum grains shall be free from abnormal flavours, odours, and living insects.

3.1.3 Sorghum grains shall be free from filth (impurities of animal origin, including dead insects) in amounts which may represent a hazard to human health.

## 3.2 Quality Factors - Specific

### 3.2.1 Moisture Content 14.5% m/m max.

Lower moisture limits should be required for certain destinations in relation to the climate, duration of transport and storage. Governments accepting the Standard are requested to indicate and justify the requirements in force in their country.

### 3.2.2 Definition of Defects

The product shall have not more than 8.0% total defects including extraneous matter, inorganic extraneous matter, and filth as contained in the standards and blemished grains, diseased grains, broken kernels, and other grains as contained in the Annex.

3.2.2.1 **Extraneous matter** is all organic and inorganic material other than sorghum, broken kernels, other grains and filth. Extraneous matter includes loose sorghum seedcoats. Sorghum grains shall have not more than 2.0% extraneous matter of which not more than 0.5% shall be extraneous inorganic matter.

3.2.2.2 **Filth** is impurities of animal origin including dead insects (0.1% m/m max).

### 3.2.3 Toxic or noxious seeds

The products covered by the provisions of this standard shall be free from the following toxic or noxious seeds in amounts which may represent a hazard to human health.

*Crotalaria* (*Crotalaria* spp.), Corn cockle (*Agrostemma githago* L.), Castor bean (*Ricinus communis* L.), Jimson weed (*Datura* spp.), and other seeds that are commonly recognized as harmful to health.

### 3.2.4 Tannin Content

(a) For whole sorghum grains, the tannin content shall not exceed 0.5% on a dry matter basis.

(b) For decorticated sorghum grains, the tannin content shall not exceed 0.3% on a dry matter basis.

## 4. CONTAMINANTS

### 4.1 Heavy Metals

Sorghum grains shall be free from heavy metals in amounts which may represent a hazard to human health.

### 4.2 Pesticide Residues

Sorghum grains shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

### 4.3 Mycotoxins

Sorghum grains shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

## 5. HYGIENE

5.1 It is recommended that the product covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice -General Principles of Food Hygiene (CAC/RCP 1-1969, Rev.

2-1985, Codex Alimentarius Volume 1B) and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to this product.

5.2 To the extent possible in good manufacturing practice, the product shall be free from objectionable matter.

5.3 When tested by appropriate methods of sampling and examination, the product:

- shall be free from microorganisms in amounts which may represent a hazard to health;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

## 6. PACKAGING

6.1 Sorghum grains shall be packaged in containers which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product.

6.2 The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They should not impart any toxic substance or undesirable odour or flavour to the product.

6.3 When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

## 7. LABELLING

In addition to the requirements of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985, Rev. 1-1991, Codex Alimentarius Volume 1A), the following specific provisions apply:

### 7.1 Name of the Product

The name of the product to be shown on the label shall be "sorghum grains."

### 7.2 Labelling of Non-Retail Containers

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

## 8. METHODS OF ANALYSIS AND SAMPLING

See Codex Alimentarius Volume 13.

## ANNEX

In those instances where more than one factor limit and/or method of analysis is given we strongly recommend that users specify the appropriate limit and method of analysis.

FACTOR/DISCRPTION	LIMIT	METHOD OF ANALYSIS
<b>COLOUR</b> White, pink, red, brown, orange, yellow, or	Buyer	Visual Examination

<p>any mixture of these colours.</p> <p>Abnormal colour, grains whole natural colour has been modified by bad weather conditions, contact with the ground, heat and excessive respiration. These grains may be dull, shrivelled, swollen, puffed, or bloated in appearance.</p>	<p>Preference</p>	
<p><b>ASH</b></p> <p>Decorticated sorghum grains</p>	<p>MAX:1.5%on a dry matter basis</p>	<p>AOAC 923.03 ICCN0.104/1(1990) Method for the determination of ash in cereals and cereal products (Ashing at 900 C) (Type I method)</p> <p>---or---</p> <p>ISO 2171:1980 cereals, pulses and derived products</p>
<p><b>PROTEIN ( N x 6.25)</b></p>	<p>MIN: 7.0% on a dry matter basis</p>	<p>ICC 105/1 (1986) Method for the determination of Crude Protein in Cereals and Cereal Products for Food and for Feed using selenium copper catalyst (Type I method)</p> <p>-----or-----</p> <p>ISO 1871:1975 ISO 5986:1983 – animal feedingstuffs-</p>
<p><b>FAT</b></p>	<p>Max : 4.0% on a dry matter basis</p>	<p>AOAC 945: 38F; 920.39C</p> <p>----or----</p> <p>ISO 5986:1983- animal feedingstuffs – Determination of Diethyl Ether Extract</p>
<p><b>CRUDE FIBER</b></p>	<p>Buyer Preference</p>	<p>ICC 113 Determination of Crude Fiber Value(Type I)</p>

		<p>-----or-----</p> <p>ISO 6541 (1981)</p> <p>Agricultural food products determination of crude fibre content-modified Scharrer method.</p>
<p><b>DEFECTS (Total )</b></p> <p>Blemished grains, (Grains which are insect of abnormal colour, sprouted, diseased, or otherwise materially damaged.</p> <p>Diseased grains. Grains made unsafe for human consumption due to decay, moulding, or bacterial decomposition, or other causes that may be noticed without having to cut the grains open to examine them.</p>	<p>MAX: (Total) 8.0%</p> <p>MAX : 3.0% of which diseased grains must not exceed 0.5%</p>	<p>Visual Examination</p>
<p><b>DEFECTS (CONT.)</b></p> <p>Insect or vermin damaged grains. Kernels with obvious weevil-bored holes or which have evidence of boring or tunneling, indicating the presence of insects, insect webbing or insect refuse, or degermed grains, chewed in one or more than one part of the kernel which exhibit evident traces of an attack by vermin.</p> <p>Grains having an abnormal colour, Grains whose natural colour has been modified by bad weather conditions, contact with the ground , heat and excessive respiration. These grains may be dull, shrivelled, swollen, puffed, or bloated in appearance</p> <p>Sprouted grains, Grains exhibiting obvious signs of sprouting</p> <p>Frost-damaged grains, Grains which are damaged by frost and may appear bleached or blistered and the seed coat may be peeling, Germs may appear dead or discolored.</p>	<p>MAX:5.0%</p>	

<p>Broken kernels, Sorghum and pieces of sorghum which pass through a 1.8 mm round-hole sieve</p> <p>Other grains which are edible grains , whole or identifiable brokens, other than sorghum (i.e., legumes, pulses and other edible cereals.)</p>	<p>MAX:5.0%</p>	
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