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High-iron

Mungbean Recipes

from

South Asia



Asian Vegetable Research and Development Center



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Introduction

The dishes in this book taste so good that it is difficult to believe that they have anything whatsoever to do with science. But on their way from South Asia, the recipes on these pages made a detour into the nutrition lab at the Asian Vegetable Research and Development Center and the purposeful consideration of Dr. M. Amirthaveni Subramanian, from Avinashilingam Deemed University, Coimbatore, India.

The goal was to get more nutrition, particularly iron, out of an already outstanding food: mungbean. Work at AVRDC had revealed that just cooking vegetables increases available iron, and that cooking certain vegetables together can increase iron bioavailability further still. The challenge was to develop recipes that combined the right ingredients and method of preparation, and were acceptable to Indian families. The recipes had to make use of readily available ingredients, could not be costly, should be easy to prepare, and had to taste great. Such recipes would surely hold value in a country suffering chronic and debilitating iron deficiency.

Each recipe in this book was tested for iron bioavailability using a method that carefully simulates human digestion. Developed by a team of United States scientists and modified somewhat by AVRDC, the method is a practical alternative to more costly and time-consuming human subject studies.

This is not an end, however, but more of a beginning. Plans are already set for village-level studies to confirm the nutritional value and acceptability of these recipes. As such, this first edition of *High-iron Mungbean Recipes From South Asia* is being assigned only a limited press run. It is hoped that future editions will be translated, modified, and refined to account for regional differences.

Lastly, it must be mentioned that this book is the product of ongoing collaboration. To assign proportional credit might prove impossible - an indication of the fruitful synergy enjoyed by the partners - but credit can go to OMNI Research and the United States Agency for International Development (USAID) for funding the nutritional research that underpins these recipes, and to USAID for funding this publication and the planned village-level studies, and to the Department for International Development, U.K., and the Asian Development Bank for funding the South Asian Vegetable Research Network.



Terms

Adai	Rice and pulses soaked, ground and cooked as a pancake with various ingredients for taste	Jaggery	Brown, partially refined palm sugar
Amaranth	<i>Amaranthus gangeticus</i>	Koottu	Mixed vegetable curry with coconut
Asafoetida	Gum resin of various plants of genus <i>Ferula</i>	Masala	Ground dried spices
Bengal gram	Pigeon pea, <i>Cajanus cajan</i>	Masial	Cooked legumes and vegetables mixed or mashed
Black gram	<i>Vigna mungo</i>	Mungbean	Green gram, <i>Vigna radiata</i>
Bonda	Large ball of legume flour dough deep fried	Pakoda	Small dough balls made from pulse and rice flour and onions, deep fried
Chapati	Flat wheat bread	Pesarattu	Mungbean dhal and rice pancake
Coriander	<i>Coriandrum sativum</i>	Pongal	Harvest festival celebrated in Tamil Nadu in January which lends its name to two recipes in this book
Cumin	<i>Cuminum cyminum</i>	Puri	Deep fried wheat flour bread
Curry	<i>Murraya koenigii</i>	Sambar	Pulse condiment
Dahl	Dehulled split pulse		
Dalda	Hydrogenated vegetable oil		
Drumstick	<i>Moringa oleifera</i>		
Ghee	Melted butter		



Mungbean is commonly sold in three forms: whole mungbean, split dehulled mungbean called dhal, and split dehulled mungbean sold with the hull. The recipes in this book make use of two of these types, plus mungbean flour. When you read mungbean listed as an ingredient, the recipe calls for whole mungbean. When you read mungbean dhal, the recipe calls for split dehulled mungbean with the hulls removed. Several of the recipes call for pressure cooking mungbean or mungbean dhal. When this initial cooking is complete, other ingredients are sometimes added to the same pot and the mix is cooked altogether. Note that pressure is used only for the initial cooking and that subsequent cooking with the combined ingredients does not require pressure unless otherwise indicated. You will also notice that metric measures are used, but that teaspoon and tablespoon conversions are supplied in parentheses for convenience. If you wish to convert grams to ounces, you'll find a simple conversion table on the inside back cover.

Mungbean masial is a simple, nutritious, hot dish which requires about 20 minutes to prepare. It can be served with rice or chapati.



Mungbean Masial

Ingredients:

Mungbean (whole seed)	:	100 g
Tomato	:	150 g
Onion	:	50 g
Green chilies	:	5 g
Garlic	:	2 cloves
Oil	:	5 ml (1 tsp)
Salt	:	2 ml (1/2 tsp)
Mustard	:	1 ml (1/4 tsp)
Cumin seed	:	1 ml (1/4 tsp)
Coriander leaves	:	2 g
Curry leaves	:	1 g

Nutrient composition:

Energy	:	509 kcal
Protein	:	27.6 g
Calcium	:	291 mg
Iron	:	6.7 mg
(bioavailability 8.83%)		
Phosphorus	:	433 mg
Beta-carotene	:	0.88 mg
Thiamine	:	0.74 mg
Riboflavin	:	0.44 mg
Ascorbic acid	:	64 mg

Serves two

Preparation:

1. Wash the mungbean and cook it in a pressure cooker with cut tomato, cumin seed, garlic, chilies, and 375 ml (1½ cups) of water for 10 minutes, and then add salt.
2. Fry mustard and chopped onion in oil until the onion turns golden brown.
3. Add curry and coriander leaves and fry for two more minutes.
4. Add the cooked mungbean, mix well and cook for five more minutes.

Mungbean dhal masial is very simple to make, is colorful, attractive, and nutritious. It can be served as a side dish with puri or chappathi or rice. Without the chilies, it can also be given to small children in dilute form.



Mungbean Dhal Masial

Ingredients:

Mungbean dhal	:	100 g
Tomato	:	150 g
Garlic	:	5 g
Green chilies	:	5 g
Oil	:	5 ml (1 tsp)
Mustard	:	1 ml (1/4 tsp)
Cumin seed	:	1 ml (1/4 tsp)
Curry leaves, a few		
Coriander leaves, a few		
Salt, to taste		

Nutrient composition:

Energy	:	523 kcal
Protein	:	28 g
Calcium	:	242 mg
Iron	:	6.2 mg
(bioavailability 10.88%)		
Phosphorus	:	512 mg
Beta-carotene	:	0.83 mg
Thiamine	:	0.74 mg
Riboflavin	:	0.38 mg
Ascorbic acid	:	64 mg

Serves two

Preparation:

1. Wash the mungbean dhal and cook it in a pressure cooker for eight minutes with the cut tomato, garlic, chilies, salt, cumin seed, and 375 ml (1½ cups) of water.
2. Fry mustard and chopped onion in oil until the onion is golden brown.
3. Add curry leaves and coriander leaves, fry for two more minutes.
4. Add the cooked dhal, mix well and cook for five more minutes.



Koottu is a delicious combination of vegetables, dhal, coconut, and chilies. Add cabbage for even more nutrition. It's a spicy, easy-to-make side dish.



Mungbean Dhal Koottu With Cabbage

Ingredients:

Mungbean dhal	:	100 g
Cabbage	:	150 g
Coconut	:	20 g
Green chilies	:	10 g
Cumin seed	:	1 ml (1/4 tsp)
Salt, to taste	:	

Nutrient composition:

Energy	:	542 kcal
Protein	:	30 g
Calcium	:	271 mg
Iron	:	7.7 mg
(bioavailability 10.10%)	:	
Phosphorus	:	547 mg
Beta-carotene	:	0.27 mg
Thiamine	:	0.63 mg
Riboflavin	:	0.41 mg
Ascorbic acid	:	199 mg

Serves two

Preparation:

1. Wash the mungbean dhal and then cook it in a pressure cooker for 10 minutes with 375 ml (1½ cups) of water, then mash it.
2. Cut the cabbage into small pieces and add it to the cooked dhal.
3. Add salt and cumin seed, cook for 10 minutes in a pan over a medium fire.
4. Grind the cumin seed, green chilies, and coconut into a coarse paste.
5. Add the paste to the dhal and cook for five more minutes.



Aside from being very nutritious, this dish produces a beautiful aroma. Koottu can also be prepared with ash gourd, ridge gourd, snake gourd, and other vegetables.



Dhal Koottu With Drumstick Leaves

Ingredients:

Mungbean dhal	:	100 g
Drumstick leaves	:	150 g
Coconut	:	20 g
Green chilies	:	10 g
Cumin seed	:	1 ml (1/4 tsp)
Salt	:	1 ml (1/4 tsp)

Nutrient composition:

Energy	:	570 kcal
Protein	:	32 g
Calcium	:	542 mg
Iron	:	7.2 mg
(bioavailability 5.63%)		
Phosphorus	:	534 mg
Beta-carotene	:	5.18 mg
Thiamine	:	0.58 mg
Riboflavin	:	0.31 mg
Ascorbic acid	:	178 mg

Serves two

Preparation:

1. Wash the mungbean dhal and then cook it with 375 ml (1½ cups) of water in a pressure cooker for 10 minutes, and then mash it.
2. Add washed drumstick leaves to the cooked dhal.
3. Add salt and cook for 10 minutes.
4. Grind the green chilies and coconut into a coarse paste.
5. Add the paste to the pot and cook for five more minutes.



Amaranth is a common leafy vegetable. It can be combined with dhal and prepared as a hot koottu. This attractive, colorful side dish is very simple to prepare.



Mungbean Dhal Koottu With Amaranth

Ingredients:

Mungbean dhal	:	100 g
Amaranth	:	150 g
Coconut	:	20 g
Green chilies	:	10 g
Cumin seed	:	1 ml (1/4 tsp)
Salt, to taste	:	

Nutrient composition:

Energy	:	565 kcal
Protein	:	32 g
Calcium	:	660 mg
Iron	:	8.4 mg
(bioavailability 6.95%)	:	
Phosphorus	:	556 mg
Beta-carotene	:	8.37 mg
Thiamine	:	0.56 mg
Riboflavin	:	0.72 mg
Ascorbic acid	:	162 mg

Serves two

Preparation:

1. Wash the mungbean dhal and then cook it with 375 ml (1½ cups) of water in a pressure cooker for 10 minutes, and then mash it.
2. Cut the amaranth into small pieces and add it to the cooked dhal.
3. Add salt and cook it all for 10 minutes in a pan.
4. Grind the cumin seed, green chilies, and coconut into a coarse paste.
5. Add the paste to the cooked dhal and cook for five more minutes.



Spinach and mungbean dhal kootu is a simple, highly nutritious dish that takes just 20 minutes to prepare.



Dhal Koottu With Spinach

Ingredients:

Mungbean dhal	:	100 g
Spinach	:	150 g
Coconut	:	20 g
Green chilies	:	10 g
Cumin seed	:	1 ml (1/4 tsp)
Salt	:	1 ml (1/4 tsp)

Nutrient composition:

Energy	:	540 kcal
Protein	:	31 g
Calcium	:	322 mg
Iron	:	8.3 mg
(bioavailability 10.59%)	:	
Phosphorus	:	511 mg
Beta-carotene	:	8.46 mg
Thiamine	:	0.59 mg
Riboflavin	:	0.66 mg
Ascorbic acid	:	55 mg

Serves two

Preparation:

1. Wash the mungbean dhal and then cook it with 375 ml (1½ cups) of water in a pressure cooker for 10 minutes, and then mash it.
2. Cut the spinach into small pieces and add it to the cooked dhal.
3. Add salt and cook it all for 10 minutes in a pan.
4. Grind the cumin seed, green chilies, and coconut into a coarse paste.
5. Add the paste to the cooked dhal and cook for five more minutes.



Tomato rice with mungbean dhal can be served for lunch or supper as a main dish. Any koottu will complement this spicy, hot dish. Tomato rice with mungbean dhal is attractive, tasty, and very easy to prepare.



Tomato Rice With Dhal

Ingredients:

Tomato	:	250 g
Rice	:	250 g
Mungbean dhal	:	75 g
Onion	:	75 g
Oil	:	20 ml
Green chillies	:	15 g
Ginger	:	5 g
Garlic	:	5 g
Salt	:	2 ml (1/2 tsp)
Masala powder	:	2 ml (1/2 tsp)
Mustard	:	1 ml (1/4 tsp)
Coriander leaves	:	2 g
Curry leaves	:	1 g

Nutrient composition:

Energy	:	1411 kcal
Protein	:	38.5 g
Calcium	:	253 mg
Iron	:	8.41 mg
(bioavailability 11.28%)		
Phosphorus	:	783 mg
Beta-carotene	:	1.16 mg
Thiamine	:	1.27 mg
Riboflavin	:	0.51 mg
Ascorbic acid	:	97 mg

Serves two

Preparation:

1. Soak the dhal and rice in water separately.
2. Fry mustard in oil, add curry leaves, coriander leaves, chopped onion, and chillies. When the onion is golden brown, add garlic, ginger, and tomato. Cook for five minutes.
3. Add salt, masala powder, and 625 ml (2½ cups) of water.
4. Add the dhal and rice. Cook it in a pressure cooker for 10 minutes.

Pongal is a dish prepared especially for celebrations. It is high in calories and usually eaten for breakfast or supper. Served with chutney or sambar, it's a great side dish, or with rice it's a fine main course.





Hot Pongal

Ingredients:

Rice	:	400 g
Mungbean dhal	:	100 g
Ghee (melted butter)	:	50 g
Cashew nuts	:	20 g
Green chilies	:	10 g
Cardamom	:	2 g
Cumin seed	:	2 ml (1/2 tsp)
Black pepper	:	2 ml (1/2 tsp)
Salt	:	2 ml (1/2 tsp)

Nutrient composition:

Energy	:	2318 kcal
Protein	:	57.1 g
Calcium	:	182 mg
Iron	:	8.9 mg
(bioavailability 5.76%)		
Phosphorus	:	1169 mg
Beta-carotene	:	0.10 mg
Thiamine	:	0.88 mg
Riboflavin	:	0.55 mg
Ascorbic acid	:	11 mg

Serves five

Preparation:

1. Wash the rice and mungbean dhal with water.
2. Cook the rice and dhal with salt and 1,125 ml (5 cups) of water in a pressure cooker for 10 minutes.
3. Fry the cumin seed, cracked black pepper, cardamom, chilies, and cashew nuts in ghee.
4. Add the cooked rice and dhal, and mix well. Serve hot.



Sweet pongal is a special dish served during the harvest festival in southern India. It's a high-calorie dessert loaded with carbohydrates and fat. It takes about 30 minutes to prepare.



Sweet Pongal

Ingredients:

Jaggery (brown sugar)	:	500 g
Rice	:	400 g
Mungbean dhal	:	100 g
Cashew nuts	:	25 g
Raisins	:	10 g
Ghee	:	50 ml (1/4 cup)
Cardamom	:	5 pieces

Nutrient composition:

Energy	:	4659 kcal
Protein	:	56 g
Calcium	:	133 mg
Iron	:	8.7 mg
(bioavailability 5.08%)		
Phosphorus	:	503 mg
Beta-carotene	:	0.06 mg
Thiamine	:	1.03 mg
Riboflavin	:	0.52 mg
Ascorbic acid	:	—

Serves ten

Preparation:

1. Wash the rice and mungbean dhal in water.
2. Cook the rice and dhal in a pressure cooker with 1,375 ml (5½ cups) of water for 10 minutes.
3. Prepare syrup with 125 ml (½ cup) of water and jaggery and strain the syrup with a muslin cloth to remove impurities.
4. Add the syrup to the cooked rice and dhal, mix well and cook it all for three more minutes.
5. Roast the cashew nuts and raisins with a little ghee and add them to the cooked rice and dhal. Add ground cardamom.
6. Add the remaining ghee to the cooked rice and dhal and mix well. Serve hot.

Pesarattu pancakes are popular in Andhra Pradesh. They are made from mungbean dhal and rice or some other cereal, and often served with coconut chutney or sambar. Since preparation entails soaking and grinding, this dish takes a little longer to prepare than most others in this book.



Pasarattu

Ingredients:

Mungbean dhal	:	100 g
Rice	:	50 g
Onion	:	50 g
Oil	:	20 ml
Red chilies	:	10 g
Coriander leaves	:	5 g
Curry leaves	:	2 g
Cumin seed	:	1 ml (1/4 tsp)
Salt	:	1 ml (1/4 tsp)
Asafoetida, a pinch	:	

Nutrient composition:

Energy	:	773 kcal
Protein	:	31 g
Calcium	:	199 mg
Iron	:	5.6 mg
(bioavailability 9.33%)	:	
Phosphorus	:	566 mg
Beta-carotene	:	0.61 mg
Thiamine	:	0.73 mg
Riboflavin	:	0.30 mg
Ascorbic acid	:	17 mg

Serves three

Preparation:

1. Clean the rice and dhal and soak them in water for two hours.
2. Grind the rice and dhal together with asafoetida, cumin seed, chilies, and salt into a coarse paste.
3. Add chopped onion, curry leaves, and coriander leaves.
4. Spread a teaspoon of oil over a hot pan.
5. Ladle the paste on to the pan and spread it evenly, forming a thick pancake.
6. When crisp and golden brown on one side, flip the pancake and cook the other side until done.



Tomato adai is a colorful and tasty dish from southern India. These large pancakes can be served as a main course and go well with coconut chutney, sambar, or vegetable curry.



Tomato Adai

Ingredients:

Tomato	:	200 g
Onion	:	200 g
Rice	:	120 g
Mungbean dhal	:	60 g
Red gram dhal	:	30 g
Bengal gram dhal	:	30 g
Black gram dhal	:	30 g
Coconut bits	:	30 g
Red chillies	:	20 g
Oil or melted butter	:	20 ml
Salt	:	5 g
Asafoetida	:	1 g
Cumin seed	:	2 ml (1/2 tsp)

Nutrient composition:

Energy	:	1527 kcal
Protein	:	52 g
Calcium	:	540 mg
Iron	:	12.7 mg
(bioavailability 9.71%)		
Phosphorus	:	907 mg
Beta-carotene	:	0.92 mg
Thiamine	:	1.59 mg
Riboflavin	:	0.76 mg
Ascorbic acid	:	86 mg

Preparation:

Serves four

1. Clean the rice and dhal and soak them in water for three hours.
2. Grind the rice and dhal together with asafoetida, chillies, cumin seed, and tomato.
3. Add chopped onion, curry leaves, coriander leaves, and water to the paste and mix well.
4. Ladle the paste on to an oiled, pre-heated pan and spread it evenly into a thick pancake.
5. When crisp and golden brown on one side, flip the pancake over and cook the other side until done.



Any vegetable that can be eaten raw can be used as a salad ingredient. Try adding soaked mungbean sprouts (top) or dhal to your salads for protein, taste, and texture.





Salad

Ingredients:

Mungbean sprouts or	
Mungbean dhal (soaked) :	100 g
Tomato :	100 g
Onion :	100 g
Cucumber :	100 g
Carrot :	100 g
Green chilies :	5 g
Coriander leaves :	5 g
Lime juice :	15 ml (1 tbsp)
Black pepper powder :	2 ml (1/2 tsp)
Salt :	1 ml (1/4 tsp)

Nutrient composition:

Energy :	476 kcal
Protein :	28 g
Calcium :	267 mg
Iron :	7.8 mg
(bioavailability 8.78%)	
Phosphorus :	964 mg
Beta-carotene :	2.70 mg
Thiamine :	0.78 mg
Riboflavin :	0.40 mg
Ascorbic acid :	70 mg

Serves six

Preparation:

1. Chop tomato, onion, cucumber, carrot, chilies, and coriander leaves.
2. Add mungbean sprouts or soaked mungbean dhal, black pepper powder, salt, and lime juice.
3. Mix well and serve.

Pakoda are fried, crispy snacks usually made from bengal gram flour with rice flour. Provided you have flour in stock, these treats take just 20 minutes to make. They're real favorites, great for special occasions, and they can be stored for up to three days at room temperature.



Pakoda

Ingredients:

Mungbean flour	:	115 g
Onion	:	75 g
Rice flour	:	30 g
Green chilies	:	4 g
Coriander leaves	:	3 g
Salt	:	2 g
Curry leaves	:	2 g
Dalda	:	10 ml (2 tsp)
Vegetable oil for deep frying	:	

Nutrient composition:

Energy	:	1030 kcal
Protein	:	31 g
Calcium	:	210 mg
Iron	:	6.3 mg
(bioavailability 5.06%)	:	
Phosphorus	:	467 mg
Beta-carotene	:	0.57 mg
Thiamine	:	0.64 mg
Riboflavin	:	0.23 mg
Ascorbic acid	:	26 mg

Serves four

Preparation:

1. Chop onion, chilies, curry leaves, and coriander. Add salt and mix well.
2. Mix mungbean flour and rice flour. Add melted dalda.
3. Add all the ingredients and mix to a thick consistency, adding a small amount of water as needed. Be sure not to make the dough too moist. You'll have to experiment a little.
4. Make dough balls of varying sizes and deep fry them until golden brown.
5. Drain on paper and serve hot.

Bonda can be described as fried curry balls with onion, and other ingredients. They're a popular snack throughout India, but especially in the south. Cooked vegetables can be added to the bonda batter for added nutrition.



Bonda

Ingredients:

Mungbean flour	:	150 g
Onion	:	50 g
Rice flour	:	30 g
Green chilies	:	10 g
Ginger	:	10 g
Salt	:	5 g
Coriander leaves	:	2 g
Curry leaves	:	2 g
Dalda	:	10 ml (2 tsp)
Egg	:	1
Vegetable oil for deep frying		

Nutrient composition:

Energy	:	894 kcal
Protein	:	46 g
Calcium	:	236 mg
Iron	:	9.6 mg
(bioavailability 4%)		
Phosphorus	:	670 mg
Beta-carotene	:	0.96 mg
Thiamine	:	0.83 mg
Riboflavin	:	0.67 mg
Ascorbic acid	:	23 mg

Serves four

Preparation:

1. Mix mungbean flour and rice flour. Add melted dalda.
2. Mix finely chopped onion, green chilies, ginger, curry leaves, and coriander leaves.
3. Add salt and egg and make batter with 50 ml (1/4 cup) of water.
4. With a spoon, pour the batter into the hot oil, little by little.
5. Deep fry the dough balls until they are golden brown, drain on paper, and serve hot.



Notes



	Metric Exact Conversion	Metric Standard Measure
SPOONS		
1/4 teaspoon (tsp)	1.2 milliliter (ml)	1 ml
1/2 tsp	2.4 ml	2 ml
1 tsp	4.7 ml	5 ml
2 tsp	9.4 ml	10 ml
1 tablespoon (tbsp)	14.2 ml	15 ml
CUPS		
1/4 cup (4 tbsp)	56.8 ml	50 ml
1/3 cup (5 1/3 tbsp)	75.6 ml	75 ml
1/2 cup (8 tbsp)	113.7 ml	125 ml
2/3 cup (10 2/3 tbsp)	151.2 ml	150 ml
3/4 cup (12 tbsp)	170.5 ml	175 ml
1 cup (16 tbsp)	227.3 ml	250 ml
4 1/2 cups	1022.9 ml	1000 ml (1 L)
DRY MEASUREMENTS		
1 ounces (oz)	28.3 grams (g)	30 g
2 oz	56.7 g	55 g
3 oz	85.0 g	85 g
4 oz	113.4 g	125 g
5 oz	141.7 g	140 g
6 oz	170.1 g	170 g
7 oz	198.4 g	200 g
8 oz	226.8 g	250 g
16 oz	453.6 g	500 g
32 oz	907.2 g	1000 g (1 kg)



