

What is an Improved Charcoal Oven?

Improved charcoal oven is a device designed for baking bread and cakes other charcoal oven is used for roasting meat. Both types of oven use charcoal as source of fuel. There advantage is the little consumption of charcoal due to heat energy conservation property. Improved Charcoal oven can serve several purposes such as cooking, roasting and baking.

Technical details of Charcoal Oven

Simple metal forming makes charcoal oven and joining processes is achieved by riveting, the main features of the oven include the followings;

- Ceramic firing box that has high capacity on heat energy conservation.
- Internal shining reflecting surfaces which ensures efficient utilisation of heat energy during baking, due to multi-reflection of heat energy inside.
- Grills that are made of steel cylindrical rods, which support baking trays.
- Double walls and air gap in between which reduce heat energy losses.
- 2-Chimneys, which facilitates escape of hot burnt gasses and ensures continuous flow of heat energy.
- Ash collectors.
- Wooden handles.

Types of charcoal ovens

There are mainly two types of charcoal ovens; first type of ovens are those which are used for baking and this group of ovens can be subdivided in two sub-groups; those without stoves and those with single or double stove(s) on the top, furthermore baking charcoal oven can be either small or large. The second type of ovens is used for roasting meat, like baking ovens there is small and big sizes of oven for meat roasting purposes. Unlike baking ovens, roasting ovens do not have stoves for cooking except multi-purpose Stove called Tekzawa, which can be used for roasting, cooking and boiling water.

Advantages of Charcoal Oven

Advantages of charcoal ovens among others include the following;

- Suitable for small-scale baking business operation for poverty reduction

- Consume little amount of charcoal fuel only 600grams of charcoal are needed to bake 48 bread.
- Reduce forest depletion because very little charcoal is used
- Can be used in areas where there are no conventional bakeries.
- Such an oven can be constructed any where in the country because raw materials and tools needed for construction are simple and locally available.

Steps to be followed on using Charcoal Oven

The following steps should be used when baking by charcoal oven:-

- Prepare all needed raw materials for baking and equipments before.
- Burn charcoal outside the oven in the small charcoal stove, and then put red-hot burning charcoal in the firing box of an oven by using togs.
- Prepare dough of bread and put them in baking tins.
- Put piece of breads in the oven, small oven has two grills, which can accommodate 6 pieces of large bread or 8 small size of bread whereas the large oven has three grills, which can accommodate up to 24 pieces of large bread.
- Arrange trays of breads in order to ensure evenly heat energy distribution in the baking chamber.
- Control heat energy inside the baking chamber air inlet hole or ash door by either closing or opening.
- An oven has two doors; small door and large door, for checking baking process progress use small door the reason is just to reduce heat energy loss during opening.

Baking Process

When food to be baked has been introduced in the baking chamber, there is a tendency of temperature drop and then temperature starts to raise slightly. The reason is due to the heat balance process between the introduced cold and wet materials and hot baking chamber.

Doors should be closed after introducing food in the oven; the reason is to avoid influence of wind that can cause shrinkage of breads or scones. Therefore doors should be closed for the first 15-20 minutes.



Baking oven with Double Stoves



Baking oven with Single Stove

Precautions on using charcoal oven

- Do not leave the door open while baking to avoid loss of heat energy due to conventional heat losses methods.
- Make sure that baking trays are well spaced to allow uniform distribution of heat, because source of heat is from the bottom where firing box is located

How to bake breads and cakes

Use ingredients for baking breads and cakes as required, mix with water and prepare a wet mass. Wet mass is cut into small sizes as required, then put them in the trays smeared with little amount of wheat flour to avoid sticking.

Put already burn fire in the oven and leave it burning in the oven for 3 minutes and then after put trays with pieces of bread or cakes. Bread baking process takes about 30 to 40 minutes while cake takes about 20 to 30 minutes, but this

depends much on the type of breads or cake. More time may be needed for baking special kind of bread or cakes.



Improved Charcoal oven for Roasting Meat

Steps to follow on roasting meat by Charcoal oven

- Prepare small pieces of meat.
- Mix small-prepared pieces of meat with salt and spices, and then leave the mixture for 1 hour to allow reaction to take place
- Put the mixture in the roasting oven for 15 minutes, control fire using air gap hole.
- Turn up meat frequently to ensure good quality of meat.
- Whenever roasting process is over cut meat into small pieces and prepare soup ready for eating.

Charcoal Ovens Management

Ensuring clean and long shelf life of the charcoal oven the following points have to be adhered: -

- Remained pieces of charcoal which have not burnt completely, should be removed from firing box.
- Grills should be cleaned and smeared by edible oil.
- Baking chamber should be cleaned by wetted piece of cloth in soap solution and then rubbed by dry and clean piece of cloth special for that purpose in and outside the oven, so that to remove moisture.
- Cleaning by pouring water inside the oven is not advised.

Training

TaTEDO offers training on baking of breads and cakes and meat roasting using improved Charcoal Oven.

Information On TaTEDO

TaTEDO is a sustainable modern energy development national NGO based in Dar es Salaam, Tanzania with activities in several districts and more than 10 years experience, actively involved in sustainable energy development projects and programmes in rural areas. The organisation is non-profit sharing for spearheading development of sustainable modern energy technologies and services while conserving the environment

Mission

To advance popular use of sustainable modern energy technologies by marginalized communities in Tanzania.

We do this through energy technologies adaptation, awareness raising, capacity building and advocacy for increased access to sustainable energy services, poverty reduction, self- reliance and environmental conservation

Goals

The goals of TaTEDO are to:-

- Improve quality of life of Tanzanians by contributing to availability of improved and sustainable modern energy services, employment and income generating opportunities, which are essential for poverty reduction,
- Reduce environmental degradation resulting from increased use of wood and fossil fuels,
- Assist the country to reduce dependence on imported energy.

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TANZANIA TRADITIONAL ENERGY DEVELOPMENT AND ENVIRONMENT ORGANISATION



IMPROVED CHARCOAL OVENS



Improved Charcoal Oven for Baking

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