FERMENTER

The fermenter is an industrial scale fermentation machine that is most applicable in helping to provide a means to produce alcoholic beverages. It is based upon the Universal fermenter by Kubouch (but is separate code), but has significantly more space for ingredients, is powered and regulates its own temperature.

The fermenter allows you to control what item is to be prepared from a selection of valid and researched items (where applicable), the size of the batch, any limits in terms of production, the ability to control production itself and also cancel a batch if the Fermenter is in the process of filling or fermenting. Like fermentation barrels the precursor wort, mash or material is prepared and then loaded into the fermenter. Then after a period of fermentation, product is removed.

In addition, if a spoil product is set in the fermenter definitions (see below), in the case where power loss and poor temperatures might cause a product to become spoiled then the spoil product will be generated instead, this will also occur if you cancel a batch during fermentation. The default spoil product is called Spoil Mash, which can be used as an animal feed, but also used in composting from various compatible mods to produce fertilizers.

In addition to the industrial tech machine shown above there is also a medieval version of the fermenter, the fermentation vat. It operates in the same way as the fermenter, but it is more susceptible to non-ideal temperatures causing the fermentation ingredients to spoil as it is not self-regulating. It is also slightly less space efficient.

Additional Content

Vinegar

The mod also supplies a rudimentary process to make Vinegar. This can then be used for other purposes but is intended to be used as an additional element that mod authors can use as part of preparations for fermentation.

To make vinegar, you first must make Acetic Acid Bacteria, which is made from a fermentation of damaged and bruised fruits (made at the brewery as a mash) to help promote the bacterial cultures.

With the bacteria you can use this to make a preparation combined with alcohols to produce a vinegar precursor item which can be fermented into vinegar.

Food Pickling and Processing

The mod includes the following items that can be made as a pickling and/or fermentation process. These processes helping to preserve or enrich the ingredients used into a better processed food substance:

Pickled Vegetables

Pickled Fruit

Pickled Fungi

Pickled Fish

Pickling is performed at the brewing station with the use of vinegar in addition to the base food resources. Though pickles can be acquired through trading. Fish can be preserved by this method where applicable mods add them to the game. Pickled fungi are considered a meat.

Fish paste is made by further fermentation of pickled fish and the fermentation process helps to restore some of the nutrients lost during the pickling process. This is also a traded item.

COOKING OILS

You can also use the fermenter to prepare cooking oils. This is done through a process of solvent extraction. The oil precursors for which are made by combining a solvent with the raw vegetable component, the solvent provided is Hexane which can be prepared at the biofuel refinery. The possible oils are listed below with new plants and their harvested materials also being provided with the mod.

CORN:

OLIVE:

SESAME:

SUNFLOWER:

Butter is prepared in a similar way to the oils, but is derived from milk and oil combination to create a precursor for fermentation.

BUTTER:

The oils and butter themselves are not intended to be used as cooking ingredients and as a result have not been assigned a nutritional value. They can however be used by placing a stack of them on say a shelf or in a fridge “adjacent” to the interaction point on a stove or bench that allows for the preparation of meals or kibble.

When a pawn or chef is then preparing meals, the oil will be slowly consumed (highest value oil/butter first in the case of multiple choice) during the meal preparations and will help to speed up the cooking process. The effect that the oils/butter have is slight and the effectiveness of the oil/butter is linked to its market value (within limits). There is also the potential to make insect butter with insect jelly as an additional ingredient, this allows for a more “pleasurable” cooking experience.

Manual Preparation

To assist with the preparation of oils there are also more rudimentary manual methods available from the medieval period:

Oil Press

The oil press can be used to press oils and prepare some other more basic precursor ingredients. This is performed as a relatively low skilled cooking job and is less efficient than the use of the fermentation vessels both in overall work time the pawn invests into the activity or in the use of the raw materials to make the oils/products.

Churn

Like the oil press, the churn allows for a low skilled cooking job to be applied to make butters. This is also again a less efficient method in terms of work activity than the use of the fermentation vessels.

In addition to the above production items there is also more specific mod compatibility to again prepare oils manually, but again are variably less efficient than the fermentation process:

Apothecary:	Apothecary Table (Use of pestle and mortar)
RC2:	Quernstone and Roller mill.
VG – Garden Gourmet:	Grindstone.

DAIRY

Fermentation can also be used to make some dairy products. To do this you first need to develop lactose bacteria cultures. This is done from preparing a starch mash to then be fermented.

STARCHY VEG

Bacterium (Lactose and acetic) can then be combined with milk to create precursors that can then be fermented into other dairy products.

YOGHURT:

Natural yoghurt can also have fruit added to it at a cooking stove or campfire to make fruit yoghurt.

FRUITS

COTTAGE CHEESE:

MOZZARELLA:

Mozzarella takes much longer to ferment and process than cottage cheese.

PASTEURISED MILK:

Milk that has been heated to remove bacteria and enzymes that would contribute to the milk spoiling. (Note: This process cannot be performed by the Vat and requires packaged survival meal research to have been completed).

CHEMFUEL (BIOFUEL)

Chemfuel (biofuel) can also be fermented from numerous organic materials prepared as a precursor to use in the fermenters.

ORGANICS

MOD DEVELOPER NOTES

As food processing machines, it is also possible to specify alternative similar processes to produce other items. The flexibility of the fermentation definitions allows for some inventive use of the machine. The machine is ready to be used after researching it's use. Further research may be needed to allow for items to appear in the selection, this being mod specific if not vanilla. Furthermore, the addition of further mod recipes is extremely straight forward with the use of a custom def, please see an example below for the fermentation of vanilla beer:

```
<Fermenter.FermentDef>
        <defName>Ferment_Beer</defName>
        <Product>Beer</Product>
        <Resource>Wort</Resource>
        <SpoilProduct>SpoilMash</SpoilProduct>
        <FermentHours>72.0</FermentHours>
        <ResearchProject>Brewing</ResearchProject>
</Fermenter.FermentDef>
```

defName: unique identifier.
Product: Name of the ThingDef as a product.
Resource: ThingDef Ingredient used (mash, wort, precursor etc).
SpoilProduct: Optional product in the case of a spoiled batch.
FermentHours: Number of hours it takes for fermentation.
ResearchProject: Optional research needed for the item to appear for selection.

The spoil product and research project elements are optional and can be left blank.

There is a routine at start-up that will check these components and provide appropriate feedback regarding the def.

Note you will have to still create your own modded definitions for precursor mashes or Worts as preparations for fermentation, including the recipes to prepare them as applicable.