Development of Wheat Grass Powder Prepared by Different Drying Processes

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ABSTRACT

Background: The mature sprouts of Wheat seeds (Triticum aestivum) known as Wheat Grass and it is one grass that has been demonstrated to be of particular use to humans as a good nutritional source. Wheatgrass is a good source of calcium, iron, sodium, potassium, and magnesium, as well as trace minerals, all B vitamins, pro-vitamin A, vitamin E, and vitamin K. In addition, wheatgrass has seventeen amino acids, eight live enzymes, and chlorophyll.

Objective: This study was carried out with the objective i.e. to prepare wheat grass powder by using different drying methods.

Materials and Methods: Different drying methods used for preparation of wheat grass powder were
1) Hot air oven drying [50°C, 6 hr and 60°C, 5hr] 2) Microwave drying [600W, 15 min and 800 W, 10 min] 3) Vacuum oven drying [50°C, 15lb, 6 hr]. Moisture content of different samples of wheat grass powder was analyzed to evaluate the best drying method for preparation of wheat grass powder.

Results: In moisture analysis microwave dried wheat grass powder [800W, 10 min] gave the lowest mean value of moisture (7.4) followed by microwave drying [600W, 15 min] (7.6), vacuum oven drying [50°C, 15lb, 6 hr] (7.83), hot air oven drying [60°C,5 hr.] (8.0) and hot air oven drying [50°C, 6 hr] (8.50). Thus, it was observed that microwave drying method was the best in comparison to other methods to prepare the wheat grass powder.

Keywords: Wheat grass powder, Microwave drying, vacuum oven drying, hot air oven drying.

INTRODUCTION

World population continues to grow; hunger and malnutrition becoming more prevalent in certain parts of the world, and the nutritional value of some commonly consumed foods declining due to nutritionally exhausted soils. So the people will increasingly have to look to alternative food sources, or nutritional food supplements, as a source of the readily absorbable vitamins, minerals, chlorophyll, and enzymes that they will need to maintain good health and enhanced immunity to disease. Grasses have been known in many cultures worldwide to have regenerative and health protecting properties for animals, including humans. Wheatgrass is a good source of calcium, iron, sodium, potassium, and magnesium, as well as trace minerals, all B vitamins, pro-vitamin A, vitamin E, and vitamin K. In addition, wheatgrass has seventeen amino acids, eight live enzymes, and chlorophyll. Availability of Wheatgrass in Powder form has proven to be very convenient and effective. Wheat grass powder retains all important nutrients of wheat grass and having higher quantity of dietary fiber, cost effective and higher shelf life than wheat grass juice. Wheat grass powder can be
easily included in the daily life of every age
group which can definitely increase their
vitamins, minerals and antioxidants intake
and in return it will protect the body from
degenerative diseases [3]

MATERIALS AND METHODS
The present investigation was
conducted in the Research Laboratory of
Centre of Food Technology-University of
Allahabad, Allahabad. The required wheat
gress leaves grown indoors in the mud pots
and it was cut when the wheatgrass growth
was at the first node stage having length of
10-12 inches. This stage is known as pre-
jointing stage.

Method of preparation of Wheat Grass Powder by Different Drying Process

Collection of raw wheat grass leaves
↓
Washing of wheat grass leaves
(To remove micro - organism and dirt)
↓
Sorting, Cutting, Grading
Hot air oven drying (50˚C, 6 Hour), (60˚C, 5 Hour)
Microwave drying (600 W, 15 min.), (800W, 10 min.)
Vacuum drying (50˚C, 15lb, 7hr)
↓
Grinding
↓
Packaging and storage

For the determination of moisture
content of different samples of wheat grass
powder, the sample was heated at specified
temperature for specified period of time and
the loss in weight was recorded as moisture
content of the sample by applying following
formula-

Percent moisture content = \( \frac{W_1 - W_2}{W_2} \times 100 \)

F- Test was applied for analysis of
variance to find the significant difference in
the means of the sample.

RESULTS

<table>
<thead>
<tr>
<th>DRYING VARIATIONS</th>
<th>N</th>
<th>Mean</th>
<th>Sd.</th>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F cal (0.05)</th>
<th>F tab</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAO(50 C /6 H)</td>
<td>3</td>
<td>8.5000</td>
<td>3.0000</td>
<td>Between Groups</td>
<td>732.933</td>
<td>4</td>
<td>1.972</td>
<td>31.81</td>
<td>3.48*</td>
</tr>
<tr>
<td>HAO(60 C /5 H)</td>
<td>3</td>
<td>8.0000</td>
<td>1.0000</td>
<td>Within Groups</td>
<td>2180.66</td>
<td>10</td>
<td>.062</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW(600 W / 15 m)</td>
<td>3</td>
<td>7.6667</td>
<td>1.5275</td>
<td>Total</td>
<td>2913.60</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW(800 W / 10 m)</td>
<td>3</td>
<td>7.3667</td>
<td>1.5275</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAC(1)</td>
<td>3</td>
<td>7.8333</td>
<td>.40415</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>7.5753</td>
<td>.79622</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Significant p ≤ (0.05)

The data illustrated in the above
table shows that F cal (31.81)>F tab (3.48),
then there is significant difference in the
mean scores of the moisture in the samples
of wheat grass powder obtained by different
drying process. It is evident from the
ANOVA table that the mean score of
moisture content of wheat grass powder
obtained by hot air oven drying [50˚C, 6
hr] is the highest (8.5) and is significantly
(p ≤ 0.05) higher than the wheat grass powder
prepared by hot air oven drying [60˚C, 5 hr.
(8.0), microwave drying [600W, 15 min]
(7.6), microwave drying [800W, 10 min]
(7.4) and vacuum oven drying [50°C, 15lb, 6 hr] (7.8). Thus the results indicate that microwave dried samples have minimum retention of moisture in the different samples of wheat grass powder which results in the maximum retention of the nutrient in the microwave dried samples of the wheat grass powder. So the microwave drying can be considered as best method for preparing wheat grass powder for adding its nutrients in our daily life. [4]

The experimental analysis clearly indicates that the % of the moisture varies with the type of drying methods used in the preparation of wheat grass powder and present study shows maximum % of moisture i.e. 8.5% found in hot air oven drying [50°C, 6 hr] [3] observed the average percentage of moisture in wheat grass powder was 6.8%. Another similar study about moisture percentage of wheat grass powder was also supported this finding. [2]

![Figure No. 1: Moisture content of wheat grass powder obtained by different drying processes](image)

**CONCLUSION**

Among all the samples of wheat grass powder obtained by different drying methods, microwave dried samples of wheat grass powder shows the minimum retention of moisture that results in maximum retention of the nutrients. So microwave drying is best method for preparation of wheat grass powder which is beneficial for the treatment of various degenerative diseases of humans.

**RECOMMENDATIONS**

Higher utilization of the wheat grass, which hardly requires formal cultivation, is recommended to be encouraged. Traditionally, Wheatgrass is known to be taken in juice form but it is recommended to use the prepared wheat grass powder because it retains all important nutrients of wheat grass and having higher quantity of dietary fiber in contrast with wheat grass juice.

**REFERENCES**
