Abstract. Ginger is one of the herbal plant species that is used as cook seasoning because it can add a distinctive flavor to foods. Ginger also has so many substance contents that is needed for the human body, such as essential oil (0,5-5,6%), zingiberon, zingeberin, zingibetol, barneol, kamfer, folandren, sineol, gingerin, vitamin (A, B1, and C), carbohydrate (20-60%), resin and organic acid. This research aims to find the value of antioxidant and quality requirements of traditional beverage powder from ginger powder. The tools which are used in the making of ginger powder with the addition of betel leaf extract are: knife, pan, filter, blender, stove, and spatula. While the tools for analyzing are beaker glass, measuring cylinder, test tube, measuring flask, oven, petri dish, Erlenmeyer. The ingredients which are used in the making of ginger powder are: ginger, betel leaf, sugar and water. The result of this research found that water contain of instant ginger betel is 2,080% while ash content of instant ginger betel is 0,533%. This research also analyzes the level of metal contamination, where the metal that is tested is Pb, Cu and Zn metal. The result of the Cu metal contamination is equal to 0,198 ppm, Zn metal is 0,527 ppm, while the Pb metal contamination is undetected. The research is also analyzing the content of antioxidant and found that the content of antioxidant is 41,632%. The conclusion is the content of metal contamination is Cu, Zn and Pb, while water content and ash content is still the same with SNI 01-4320-1996.

1. Introduction
Indonesia has abundant natural resources, including types of herbal plants. From various herbal plants, some types of them have a health benefit. The one plant that is known to have health benefit is Ginger. Ginger is one type of medicinal plant that is usually used as a spice because it can add the flavor to food. Ginger can also be relied as a non-oil and gas export commodity in the form of fresh ginger, dried ginger, essential oil, and oleoresin. Ginger has been widely known and used for various purposes, such as a mixture of food, beverage, cosmetics, and perfume. Many research results proved various benefit of ginger rhizomes, including anti-diarrheal, antioxidant, anti-hepatotoxic and antipyretic activities[1], [2].

Ginger has a functional contains as an antimicrobial and antioxidant. One of inhibiting growth component of E. coli bacteria is gingerine and gingerol, while antioxidant ability comes from gingerol and shogaol contain [3]. Based on previous research, the major constituents in ginger are

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carbohydrates (50–70%), lipids (3–8%), terpenes (zingiberene, β-bisabolene, α-farnesene, β-sesquiphellandrene, and α-curcumene), and phenolic compounds (gingerol, paradols, and shogaol).[4]

The purpose of making ginger powder is to increase the sale value of ginger and make ginger easily to consume, then the addition of betel leaf extract to increase the benefit of the ginger powder. One of the benefits of betel leaf extract is to cure asthma and help in menstruation. The purpose of this study was to determine antioxidant activity, as well as the quality requirements (water content, ash content, and content of heavy metal contamination) from traditional beverage powder, namely ginger powder in addition to betel leaf extract.

2. Research methodology

2.1. Research material

The tools used for making ginger powder with the addition of betel leaf extract are: knives, pan, filter, blender, stove, and wood stirrer. The tools for analysis are beaker glass, measuring cup, spatula, test tube, measuring flask, oven, petri dish, erlenmeyer, and funnel. The ingredients used for making ginger powder are ginger, betel leaves, sugar, and water. The chemicals used are supporting materials for the analysis of antioxidant DPPH (1,1-diphenyl-2-pectrhydrazil).

Antioxidant testing using the DPPH method was carried out using 0.1 ml of sample extract diluted with various concentrations. The extract was then reacted with 3.9 ml of DPPH solution (2.4 mg DPPH / 100 ml methanol) and homogenized. After 30 minutes incubated at room temperature followed by absorbance measurements with a spectrophotometer at a wavelength of 516 nm. 0.1 ml of methanol (as blanco) was reacted with 3.9 ml of DPPH in the 0th minute. For each test, three replications were carried out, and the results were delivered in an average form. Antioxidant activity is calculated by the equation:

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\% \text{ inhibition} = \left( \frac{\text{Abs blanco} - \text{Abs Sample}}{\text{Abs blanco}} \right) \times 100 \%
\]

Abs : absorption value

Testing of moisture content using the gravimetric method. The gravimetric method is carried out by means of drying using an oven at 105oC for 4-5 hours (W0) weighed and dried to a constant mass. Then the petri is weighed with a sample and dried to a constant mass (W1) until the weight of the water evaporates with the weight of the wet sample.

2.2. Research implementation

Material preparation includes making betel leaf extract, which is betel leaf collecting, weighing, blending it to a pulp, soaking by using water, filtering, and producing filtrate (betel leaf extract).

The process of making ginger powder begins with ginger collection, sorting, stripping, washing, and weighing of ginger and water. Then shredded, then filtered to obtain the filtrate or ginger juice. Ginger and betel leaf extract are mixed in a pan which is then heated to boiling. Fast stirring until crystalized. Ginger powder that produced is mashed using a blender, then sieved with a sieve to produce ginger instant powder.

Instant ginger powder will be analyzed for nutritional value, antioxidant, and traditional drinks powder standard quality from ginger powder.

3. Results and discussion

3.1. Water content

Moisture is the percentage of the water content of a material. Water in food ingredients is one factor that affects metabolic activity, such as a microbial activity that can affect nutritional quality[5]. The water content in the powder material also determines the durability of raw material. In this study, a sample of instant ginger produced in Tlogowungu Village, Kaloran, Temanggung. The result of the water content analysis of instant betel ginger is 2.080%, where the moisture content matches into the
standard of traditional beverage powder quality of SNI 01-4320-1996. Where in the SNI, the water content is allowed up to 3.00%.[6] Drying method that can be used to make powder drinks such as ginger powder, among others, using spray drying. The obstacle when using this method is that it is very expensive in terms of cost so it is not suitable for medium businesses or small businesses. Another method of drying is drying with an oven with a temperature of <100°C. High temperatures adversely affect nutrient content. The temperature of the oven used is too low (<50°C) causing a long drying process. Therefore, the drying process is better at a temperature of 60-80 °C[7], [8].

The benefits of water in food as one of the factors that affect the activity of enzymes, microbe, chemical processes, which cause changes in organoleptic properties, as well as nutritional value. Water in food is expressed as a percentage of water content, AW, or RH. Water content is the percentage of the water content of a material can be expressed in wet weight (wet basis) or dry weight (dry basis). Water activity or water activity (AW) is the amount of free or unbound water in a system that can support biological and chemical reactions. Relative humidity (RH) is defined as the ratio between the water vapor partial pressure to a certain temperature saturated vapor pressure [9], [10].

3.2. Ash content
Ash is the residual inorganic material from the complete combustion process at 600 °C for a few times. The amount of ash content of food products depends on the amount of mineral content of the ingredient used. Food ingredient is at least 96% containing organic and water. The rest consists of mineral elements or ash content.[5] According to SNI 01-4320-1996 the ash content allowed in traditional drinks powder is up to 1.5%. The result of ash content from instant betel ginger obtained at 0.533% where the ash content was still allowed by SNI 01-4320-1996. Determination of total ash content can be used to determine whether or not processing of food ingredients, knowing the type of material used, and as a determinant of nutritional value parameters.

3.3. Metal contamination content
In this study, the metal contamination content analysis of instant betel ginger sample. The metal contamination content analysis was carried out because if the content of metal contamination in the sample exceeded into the limit and consumed by a human could cause spontaneous interference. The metal contamination analysis in this sample are metal contamination content of Lead (Pb), metal contamination content of Copper (Cu) metal contamination content of, and metal contamination of Zinc (Zn). The method used in measuring metal contamination is the Atomic Absorption Spectrophotometer (AAS). The result of the analysis is that Lead content (Pb) in instant betel ginger is unknown, the content of Copper (Cu) in instant betel ginger is 0.198 ppm and the content of Zinc (Zn) for instant betel ginger is 0.527 ppm. Where the metal contamination content still allowed into SNI 01-4320-1996. Where the maximum content of Lead (Pb), Copper (Cu), and Zinc (Zn) are 0.2 ppm; 2.0 ppm and 50 ppm.[6]. Food is often polluted by inorganic components, including various dangerous heavy metals. Heavy metals are high molecular weight metal elements. Low-grade heavy metals are generally toxic to plants, animals, and humans.

3.4. Antioxidant content
The determination of antioxidant activity is using DPPH method. The DPPH method is chosen because it is simpler, easier, and faster. Another advantage is the DPPH method requires only a small sample to be tested so it can be used widely to test the ability of compounds as electron donor. DPPH testing method is a conventional method and has long been used to determine the activity of the antioxidant compounds.[11] The test is carried out at a wave of 516 nm because it is the maximum wavelength of DPPH.[12] The test method using DPPH is based on a decrease in absorbance due to discoloration solution color in DPPH color, where DPPH reacts to hydrogen atom from free radical reducer compound to form a more stable DPPH-Hydrazine. DPPH reagent that reacts to antioxidants will cause discoloration from purple to yellow. Color intensity depends on the ability of the antioxidant.[13]
The principle of this method is the measurement of DPPH fishing arrests with antioxidant activity compounds using spectrophotometry so the value of the antioxidant activity is known. From the picture, it can be seen that the highest value of the antioxidant activity of instant ginger is 41.632%, and in instant betel ginger is 34.990%. This difference is because instant ginger only consists of ginger, where the value of antioxidant activity from ginger is very high. While instant betel ginger consists of two mixes, betel leaf, and ginger extract, in which the mixture of these two ingredients can increase the value of the antioxidant activity. The antioxidant strength of ginger powder mixed with betel leaf extract increased 6.642% and included in the strong category (IC50 value is between 10-50 µg/mL)[14].

4. Conclusion
Ginger is a rhizome plant that can be used for various kinds of processed products. One of the commodities in Tlogowungu Village is ginger. This ginger is used as a raw material for making instant ginger in Tlogowungu Village. The produced instant ginger met the standard of traditional beverage powder quality (SNI 01-4320-1996). The combination of ginger powder and betel leaf extract can increase antioxidant strength by 6.642% from its original value. This drink is categorized as containing strong antioxidant categories.

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