

# Taste Language for Taste Centered Cooking: 14 patterns for Japanese soup stock

CHIAKI SANO, Faculty of Environment and Information Studies, Keio University

YUKI KAWABE, Graduate School of Media and Governance, Keio University

RIOJA KURODA, Faculty of Environment and Information Studies, Keio University

TAKASHI IBA, Faculty of Policy Management, Keio University

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This paper proposes the idea of “Taste Language”, which is a form of language that supports taste-centered-cooking. Taste-centered-cooking is an approach of cooking where people focus on creation of taste rather than just following the procedures of a recipe. However, this is not easy as taste cannot be known beforehand and cannot be designed in just an assemble of pieces. As a solution to overcome this difficulty, we propose “Taste Language”, a form of pattern language that addresses the principles of rich and delightful taste. As a first study of “Taste Language”, we created “Japanese Soup Stock Patterns”, which is a pattern language that consists of 14 patterns. This paper will present “Taste Language” and introduce the overview of “Japanese Soup Stock Patterns” along with examples of dishes cooked by using the patterns.

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## 1. INTRODUCTION

Have you ever thought about taste when cooking? For instance, do you imagine what kind of taste will be made when you cook tomato soup? Have you ever cooked while think about how to finish it? Many people might have never been conscious. In many cases, you look at the recipe, prepare the ingredients, and cook them either following the process written in the recipe or your previous experience. The recipe does not say much about the taste. In consequence, it is not until you eat a dish that you realize its taste is delicious or not. However, there are some principles lurking behind the good taste, and filling them will result in a delicious dish which has certain quality.

In this paper, we will introduce taste-centered-cooking that is an approach of cooking and propose “Taste Language” as a tool to support the approach. As a specific example of “Taste Language”, we would like to introduce the overview of “Japanese Soup Stock Patterns”.

## 2. TASTE-CENTERED-COOKING

Taste-centered-cooking is an approach of cooking where people focus on creation of taste. People eat everyday not only to take nutrients from food, but also to feel happy and make their life rich. To achieve these effects, people try to cook delicious dishes. The most important element in the delicious dish is the taste. Therefore, we positioned the essence of cooking as an act of enriching taste.

When you cook something, in many cases you use recipes. They describe the procedures of cooking. By following them it's easier to cook a dish even if you have never eaten the one. Recipes are useful tools helping you cook. However, the recipes have various limitations and they are discussed in a 2015th study (Isaku, 2015). The study finds the following commonalities in the limits of cooking recipes and master plans criticized by C. Alexander who proposed pattern language.

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In efforts to optimize production with low costs and less labor, they have lost somewhat an important idea behind houses and food. If people were just taught to read and follow directions on how to cook, the essential principles behind the design process will become lost.

Simply following the recipe may not be able to produce a delicious dish because the essential principles behind the cooking process are lost. However, if you understand the principle of creating a good taste behind the process, you can make a delicious dish with or without a recipe (fig.1). In the taste-centered-cooking, we take the essential principles as how to make good taste.

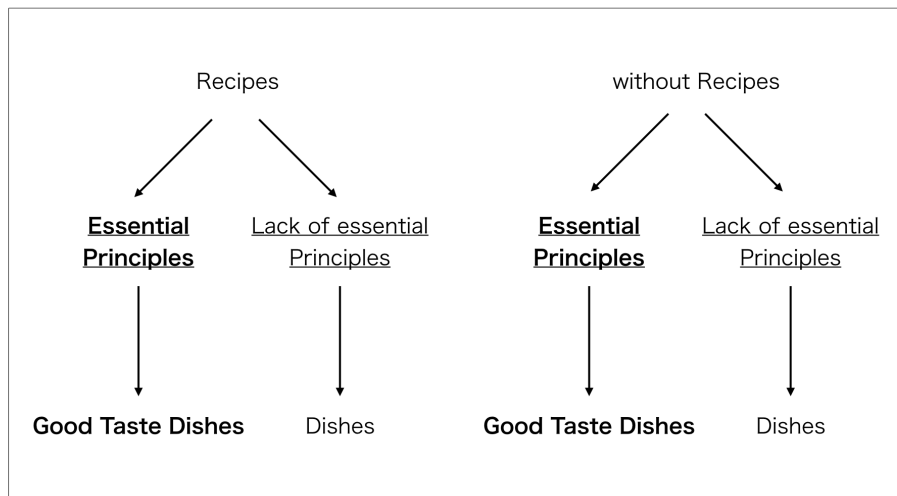


fig.1. Relationship between recipes and essential principles in cooking

On the other hand, it is difficult to cook, paying attention the essential principles. This is due to a property of dishes. Dishes are not a collection of ingredients, but they exist as a whole. For example, no one sees a hamburger as lettuce, tomatoes, meat with ketchup, and pickles sandwiched between buns with sesame on top. Everyone recognizes it, as “a hamburger”. Only when all ingredients are mixed and influential on each other, they can exist as a dish.

This is common to discussions of wholeness in architecture. According to Alexander, a view of the building as a whole means that we see it as part of an extender and undivided continuum (Alexander, 2002). When a dish is perceived as a whole, it should be designed while maintaining the wholeness. However, many of the existing recipes suggest making a dish by adding the ingredients.

The same goes with taste. Feeling the deliciousness does not mean decomposing every taste like sweetness and saltiness, but it means feeling the overall taste. Richness expressed by the taste of dish is one example. The richness doesn’t have a clear definition, but its taste is complex and harmonious. In order to realize and make it, a large amount of experience is essential.

Besides, delicious dishes can also be made unexpectedly. It takes a short time of 10-30 minutes to cook in everyday life, and the taste changes depending on various situations such as time and environment. Even if you don’t use recipes, you can cook something with any ingredients in the refrigerator. However, you do not know that is delicious until you have finished cooking.

For these reasons, it is very difficult to make a good taste in daily cooking. In contrast, chefs have overcome this difficulty through their experiences. Therefore, we propose “Taste Language” that supports daily taste-centered-cooking.

### 3. TASTE LANGUAGE

Taste Language is a collection of words for expressing the taste and the way to achieve it. Focusing on taste that you have not been aware of during cooking, you will make dishes rich.

Taste Language is expected to have three effects. Firstly, by designing taste with patterns, you could have clear image about the taste of the dish even before cooking, as well as could think about enhancing the quality of dishes that you have never challenged before. In addition, when you find delicious dishes, you analyze the reason why these are delicious, and you can reproduce the taste. Second, you could create a variation of taste for each

dish while keeping the essential principles. You do not need to make correspond each dish and one taste, and you can make “new recipes of the dishes”. Third, you can create a comfort taste even if the menu is different. Grasping characteristic of dish through patterns, you could recreate it with using them. In the taste-centered-cooking, combining patterns could enhance the main character of each dish.

We introduce Japanese Soup Stock Patterns as a first example of Taste Language. Before that, we make the position of our research clearly by comparing previous research and explaining why we focus on Japanese soup stock.

### 3.1 Previous Research about Cooking in the Pattern Language Context

Taste Language is written in pattern format. Concretely, it is described context, problem and solution, and the name is given. This is due to practice taste-centered-cooking while you understand the essential principles of delicious dishes. C Alexander, who proposed pattern language, described principles of design process for spaces and buildings that have a certain quality with pattern. Taste language helps you to connect the taste you want to achieve with the actual cooking way.

So far, Previous researches on pattern language related to cooking have been carried out from various viewpoints as shown on the following table1. One is to improve the quality of human behavior through cooking. For example, Creative CoCooking patterns, Patterns describing collaboration through cooking (Isaku & Iba, 2015), Cooking Patterns to improve individual cooking skills (Akado, et al, 2016), and Cook-That-Dish Patterns for Tacos (Yoshikawa, et al, 2017), a recipe-like collection of patterns that function as a participation-inducing tool in collaborative cooking sessions. These patterns assist designing human behavior on cooking. In parallel, research is being conducted to explain the function of food ingredients using the pattern format. By describing the functions of ingredients, Cooking Language (Isaku, 2015) deepens understanding of recipes and cooking, as well as guidelines of decision making during cooking.

However, there has been no discussion about the design on the “taste of dish”, which is a product of cooking. Therefore, we support to create the taste that everyone wants to make, by creating patterns using pattern language method. Unlike recipes, pattern language that can describe the effect each action has, is used as a building block of thought to facilitate the customization of taste.

Table 1. Previous Researches and their themes

Title of Pattern Language	Theme of Pattern Language
Creative CoCooking patterns(Isaku & Iba, 2015)	supporting collaboration through cooking
Cooking Patterns(Akado, et al, 2016)	improving cooking skill
Cook-That-Dish Patterns for Tacos (Yoshikawa, et al, 2017)	inducing collaborative cooking
Cooking Language (Isaku, 2015)	function of ingredients

### 3.2 Background of Japanese Soup Stock Patterns

In cooking, making a firm base of taste is a fine way to practice a delicious taste. In Japanese cuisine, dashi is the basis of cooking, therefore refining it is very important. Dashi is a liquid from which umami is extracted by boiling down various ingredients or soaking them in water. Soup stock exist in all kinds of cuisines. The typical Japanese dashi ingredients used are kombu (fig.1) and bonito (fig.2). Kombu is a large Japanese seaweed. Making dashi varies depending on the material and how it is extracted. In dashi material, both umami and miscellaneous taste exist together. It takes a chef's skill to extract just umami. Toru Fushiki, who studies the taste of dashi, explains how to make dashi as following.

“If you boil dashi ingredients for a long time, many taste components will come out, but unfortunately, so do unpleasant tastes and flavors too” (Fushiki, 2006, p32, translated by authors of this paper)

“Unnecessary things become impurities in laboratories, and miscellaneous taste in kitchens. If the temperature is low, there will be no extra components coming out, but it will also be difficult to produce important substances, and it will take too much time. The adjustment of temperature and time relies on years of experience. (Fushiki, 2006, p34, translated by authors of this paper)

There is a part that heavily relies on years of experience, in order to eliminate the miscellaneous taste as much as possible and make a sophisticated dashi.

Also, how it is used in cooking changes depending on the way of making dashi. Dashi which has emphasis on aroma with little miscellaneous taste is used for delicate dishes such as soup, and dashi that includes miscellaneous taste but with strong umami is used for dishes with rich and heavy taste such as deep boiled food (also called as “nimono”). Merely adding dashi to the dish is not enough, it is necessary to change how it is made and used according to the taste.



fig.1. Dried Kombu



fig.2. Dried Bonito Flakes (Katsuobushi)

### 3.3 Japanese Soup Stock Patterns

Japanese Soup Stock Patterns is a collection of fourteen patterns that describes how to design the taste of cooking using dashi. It is classified into three categories, “choose the dashi material”, “make the dashi” and “use the dashi”, configured to support the design of taste comprehensively, from selecting materials to actual use (fig.3).

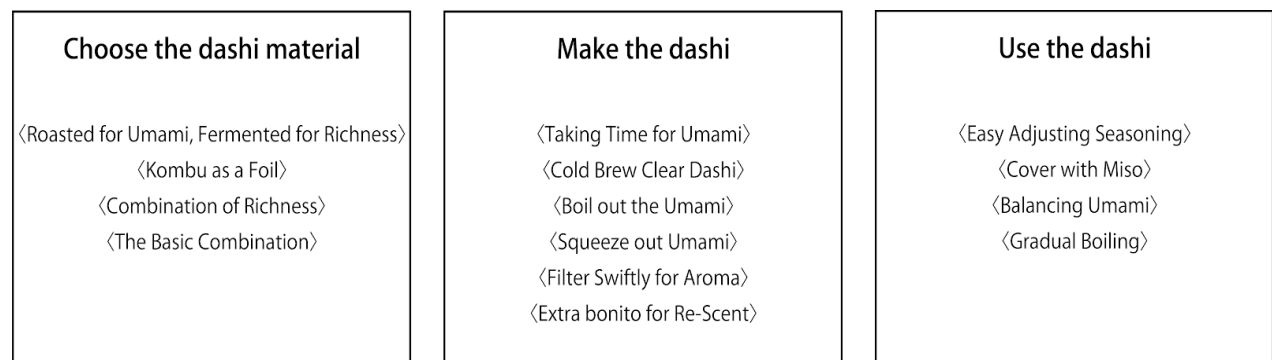


fig.3. Overview of the Japanese Soup Stock Patterns

The implementation of the patterns creates a clearer understanding on how to use the dashi. You can realize the taste changes by the choice of dashi and ways of making dashi. Therefore, when an individual cook, dishes that feel satisfaction and happiness can be made by not changing the menu but changing the taste itself. It can also widen the range of daily cooking, by knowing ways to practice the taste suitable for the individual. These patterns are listed on appendix.

#### 4. EXAMPLES OF TASTE CENTERED COOKING WITH JAPANESE SOUP STOCK PATTERNS

In this section, to show how these patterns could be used, we present two examples, cold Japanese risotto called “hiya-jiru” and simmered eggplant and pork with dashi, which are cooked using Japanese Soup Stock Patterns.

##### 4.1 First Example of Taste-centered-cooking

First, this is the example of making comfort taste. Cold soup risotto is the dish shown in figure.4. It is a dish with cold dashi on top of ingredients such as leek, cucumber, and steamed chicken. It is easy to eat even when there is no appetite in hot summer season. When making this, it was hot but had the appetite to eat something heavy and filling, so by using <Boil out the Umami> and <Squeeze out Umami> it enhanced the taste of the dashi itself. In order to suppress the odor and miscellaneous taste, it was seasoned with <Cover with Miso>.

##### 4.2 Second Example of Taste-centered-cooking

Secondly, simmered eggplant and pork with dashi is the dish shown in figure.5. This is made without the recipe. Eggplant is fried with pork and then boiled in dashi. Eggplants are easy to absorb fluids, so by not only just frying, but they become more delicious when boiled in dashi. In addition, it can be enjoyed as soup with melted flavor of ingredients into dashi. Using <The Basic Combination>, <Combination of Richness> and <Extra Bonito for Re-Scent>, it made the dish with strong umami and aroma. In order to take advantage of the animal flavor from pork, vegetable dashi was taken with kombu which goes well with animal dashi. The umami and dashi flavor from the ingredients are intricately intertwined, creating a rich and tasty dish.

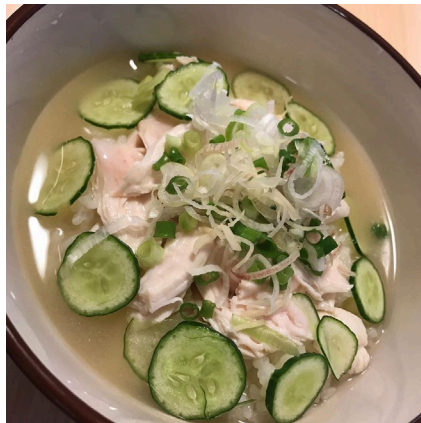


fig.4. 1st example of usage



fig.5. 2nd example of usage

#### 5. CONCLUSION

In this paper, we proposed taste-centered-cooking and introduced Taste Language to support it. Thinking of everyday cooking as exploring taste is a creative cooking process that is different from following familiar procedures. Taste Language shows not only principles of delicious dishes, but also the ways of putting them into practice. By using the language introduced in this paper, you can capture the principles behind delicious dishes and create dishes of attractive quality. In addition, you can analyze the tastes provided by a nice restaurant, and then you can reproduce them at home.

We introduced fourteen patterns focused on Japanese soup stock as an example of Taste Language, but Taste Language could be made with any other ingredients.

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## APPENDIX

### 1. Roasted for Umami, Fermented for Richness

Dashi made by dried bonito plays a role adding strong umami and aroma.

#### ▼ In this context

If the dashi doesn't match with other ingredients, the good quality of the dashi will not appear in the dish, or the dashi will erase the good quality of the other ingredients. There are two types of bonito dashi, roasted dried bonito called as "arabushi" and fermented dried bonito called as "karebushi".

#### ▼ Therefore

If other ingredients have enough umami, use roasted dried bonito, and if you want to add umami or aroma to dashi, use fermented dried bonito. The roasted dried bonito is finished with roasting, and the fermented dried bonito is further molded and fermented after roasting is done. There is spiciness and richness in roasted dried bonito, and fermented dried bonito has a rich aroma and mellow depth.

#### ▼ Consequently

By using different dried bonito, you can clarify the characteristics you want to add to the dish. In addition, the richness and aroma added by dashi supports the taste of other ingredients and gives the dish a sense of unity.

#### 〈Example of use〉

Roasted dried bonito goes well with miso soup and fermented dried bonito goes well with Japanese clear soup called as "osumashi". Using fermented dried bonito in miso soup which enjoys the aroma of miso itself, will offset the aroma.



Japanese clear soup

## 2. Kombu as a Foil

Dashi has a role of enhancing the taste of ingredients and putting together the whole dish.

▼ In this context

If the aroma and umami of dashi are too strong, it drowns out flavor and aroma of the ingredients which you want to make use of. If the main flavor is weak, only the flavor of seasoning will be felt and it will not taste delicious.

▼ Therefore

Use kombu dashi with umami that do not stand out. Kombu dashi adds umami without erasing the taste and aroma of ingredients, allowing you to have a cohesiveness in your dishes.

▼ Consequently

The ingredients you want to enhance stand out and, at the same time, the synergistic effect with the kombu dashi and the ingredients enhance the umami and makes a delicious dish.

〈Example of use〉

Kombu dashi is particularly suitable for dishes with delicate-taste ingredients like, boiled tofu “yudofu”, unthickened stew of chicken called as “mizutaki” and fish with sweet and starchy sauce “shiromizakana-no-ankake”.



Boiled tofu



unthickened stew of chicken



fish with sweet and starchy sauce



### 3. Combination of Richness

Dashi has a role of adding richness to dashi.

▼ In this context

Richness is not born by only extracting umami. Richness is made by various umami intertwined.

▼ Therefore

Mix dashi made from multiple ingredients to make a rich dashi. Components included in each material are different. In addition to combining materials with same components, try combining various types of materials such as vegetable dashi and animal dashi to add special characteristics to the dishes.

▼ Consequently

The rich dashi with a variety of flavors is the basis for a delicious meal.

〈Example of use〉

Chicken stew with taro “chikuzen-ni” is finished in a mellow and moist taste by melting the umami of various vegetables and meats in addition to the base dashi of dried bonito and kombu. Pot-au-feu which is called “potohu” in Japanese is a soup with a delicious flavor of a mix of dashi from various vegetables and meats.



Chicken stew with taro



#### 4. The Basic Combination

Dashi with various umami ingredients has complexity.

▼ In this context

Complexity will not be created unless the dashi material creates a synergistic combination with each other. Even if the materials are combined with similar ingredients, umami will not appear strong.

▼ Therefore

Make dashi based on the combination of vegetable dashi and animal protein dashi. Kombu and dried bonito or kombu and chicken are examples of ingredients that are compatible with each other.

▼ Consequently

You can make good dashi with compatibility of glutamic acid and inosinic acid, which are umami ingredients. Vegetable materials contain glutamic acid, and animal protein contains inosinic acid. The taste is the strongest when the ratio is one-on-one.

〈Example of use〉

For the sobas and udon noodles, use a dashi that has a strong umami made by the synergistic effect of kombu and dried bonito. For Japanese mixed rice “takikomi gohan”, when chicken is added to the kombu dashi, the umami increases due to a synergistic effect with the dashi from the chicken.



Udon noodles

## 5. Taking Time for Umami

Dashi supports the taste of the ingredients and gives the dish a unity.

▼ In this context

When umami is extracted, odor and miscellaneous tastes that comes out with umami can greatly impair the quality of the dish. In particular, when boiled at high temperature, many kombu slime components, miscellaneous tastes, and astringency called egumi appear from dried bonito. Kombu's slime component also contains umami, but it causes miscellaneous taste.

▼ Therefore

Kombu is boiled for 30 to 60 minutes, and dried bonito is boiled for 10 to 15 minutes at 60 to 70 degrees Celsius where small bubbles come out. By slowly raising the temperature, moisture penetrates into the tissue of ingredients and a lot of umami is extracted.

▼ Consequently

Dashi with less odor and miscellaneous taste while firmly holding umami, serves as a base for dishes that enhance other ingredients. Dashi with less miscellaneous taste and odor can be used in a wide range of dishes from simple dishes to dishes that use many ingredients.

〈Example of use〉

Use dashi with less miscellaneous taste for dishes that are mild, such as Japanese omelet “dashi-maki” and Japanese steamed egg custard “tyawan-mushi” and dishes like boiled seasoned vegetables “ohitashi” that use dashi as a base for taste without adding other seasonings.



Japanese omelet



Japanese steamed egg  
custard



Boiled seasoned  
vegetables

## 6. Cold Brew Clear Dashi

Kombu dashi that has no miscellaneous taste and odor is suitable for delicate ingredients.

### ▼ In this context

When heat is applied, extra ingredients like odor and slime components come out with umami and aroma. The optimum temperature to be extracted depends on the component making it difficult to control and extract the taste.

### ▼ Therefore

Apply to room temperature water for about 90 min to make dashi. The umami component of kombu is crystallized during the process and because it is attached near the epidermis of kombu, the umami ingredients themselves can be removed by extracting the crystallized umami component.

### ▼ Consequently

It is time consuming to extract umami with room temperature water than applying heat, but with room temperature water, it is easily made with little miscellaneous taste and odor. Although it does not produce unpleasant odor found in seaweed, it becomes a convenient dashi, but it does not give a good aroma.

### 〈Example of use〉

It has almost no odor and slimy components, so it can be used for any dish. If you put kombu in room temperature water the day before, you can save the trouble of taking dashi on the next day.

## 7. Boil out the Umami

Dashi with a strong umami can be made by extracting umami components from the surface to the core of dashi material.

▼ In this context

By extracting umami using 〈Taking Time for Umami〉, many other components are left in the material. The number of extractable components is related to the boiling temperature.

▼ Therefore

Simmer the dashi material in boiling water. The taste of dashi increases by extracting minerals and polysaccharide with boiling water. The aroma and odor that come out at the same time evaporates when boiled.

▼ Consequently

Dashi that match with dishes like deep boiled food “nimono” and hot pot “nabe” that soak the taste of the ingredients can be made. However, the miscellaneous taste unique to the dashi material comes out.

〈Example of use〉

Beef and potato stew “niku-jyaga” and hot pot “motsu-nabe” are seasoned, so it is easy to ease the miscellaneous taste found in dashi and make dishes with strong taste of dashi.



Beef and potato stew



Hot pot

## 8. Squeeze out Umami

Umami is contained from the surface to the core of dashi material.

▼ In this context

After transferring to a strainer, merely waiting for the dashi to filter leaves many other components in the material.

▼ Therefore

Wrap the dashi material with a paper towel and press it against a strainer and squeeze out the components.

▼ Consequently

Components that were not extracted by boiling can be extracted and creates a thick dashi. Components with umami are extracted and other components like miscellaneous taste, uncomfortable sourness and bitterness can also be extracted.

〈Example of use〉

The use of dashi with a strong umami is recommended for dishes that have a strong taste like braised pork belly “kakuni” or curry udon noodle. Deep seasonings, condiments and spices alleviate miscellaneous taste. This method is also used when using all the flavors of ingredients.



Braised pork belly

## 9. Filter Swiftly for Aroma

Clear aroma is an important element of fine dashi.

▼ In this context

Boiling dashi material for a long time evaporates the aroma and creates miscellaneous taste.

▼ Therefore

Boil with water of 60°C to 70°C which starts to create small bubbles and without squeezing, filter the dashi quickly. By swiftly filtering the dashi, you can leave the aroma without evaporating.

▼ Consequently

The good scent of dashi creates an impression and an aftertaste, making a memorable cuisine.

〈Example of use〉

The aroma is the decisive factor of dashi for soup-type appetizer “wan-mono” and noodles.



Soup-type appetizer

## 10. Extra bonito for Re-Scent

The rich aroma of dried bonito dashi promotes appetite.

▼ In this context

Dashi with rich aroma is boiled with a short time which makes it hard to extract umami completely. On the other hand, to extract enough amount of umami it needs time to boil, which means the evaporation of aroma.

▼ Therefore

Start by taking time extracting umami and to the finished dashi, add pieces of dried bonito to re-scent. You can also add aroma to dashi that were made a few days ago.

▼ Consequently

It becomes a dashi that has both strong umami and strong aroma. Also, a rich aroma can be added by adding pieces of dried bonito right before the dish is completed.

〈Example of use〉

We use dashi with both flavor and aroma for dishes that use starchy sauce. Sprinkle dried bonito flakes to simmered vegetables “nibitashi” to add flavor and aroma of dashi.



Simmered vegetables



## 11. Easy Adjusting Seasoning

Adding Japanese seasoning to dashi can make an all-purpose seasoning.

▼ In this context

Adding saltiness and sweetness will merely make the taste strong. A flavorful taste requires a balance of not only saltiness and sweetness but also umami.

▼ Therefore

Adjust the seasoning by the amount of umami in the dashi. Dashi with strong umami requires salt and sugar that contains weaker umami and dashi with weaker umami requires soy sauce and sweet sake that contains stronger umami.

▼ Consequently

With sweetness, saltiness and umami combined in dashi and seasoning, it becomes an all-purpose seasoning. You can adjust the taste by changing the sweetness, saltiness and umami.

〈Examples of use〉

This pattern can be used for pickled fish and as a seasoning for deep boiled dish “nimono”. You can adjust the taste according to your likings and dish by using dashi seasonings which is easy to adjust the flavor.



Deep boiled dish

## 12. Cover with Miso

Dashi with strong umami can be made by heating with high temperature or boiling for a long time.

### ▼ In this context

A miscellaneous taste and a strong odor come out when extracting umami. The odor evaporates after boiling but the miscellaneous taste remains in dashi. Even though a firm tasted dashi is necessary for a filling dish, the miscellaneous taste and the odor makes it difficult to use.

### ▼ Therefore

Ingredients with strong flavor like miso can cover miscellaneous tastes and odor. Miso, which contains ample saltiness, sweetness, umami and aroma, is used when cooking ingredients with strong taste.

### ▼ Consequently

Miscellaneous taste and odor alleviate, and a complex taste is made by umami and seasoning combined. Because all kind of smell weakens, adjust the type of seasoning to use and the amount of usage.

### 〈Example of use〉

For the cold soup “hiya-jiru”, add a small miso after the umami of the dashi is fully applied. By adding miso as a secret ingredient, miscellaneous taste and odor alleviate.



Cold soup

### 13. Balancing Umami

Dashi play a role as a seasoning to add umami

#### ▼ In this context

The taste of dish becomes blur or heavy when there is a gap in the heaviness of taste between ingredients and dashi. When you match a heavy tasted ingredient and a bland tasted dashi, the taste of dashi hides behind the ingredients and makes the dish blur and bland. Also, when you match a delicate tasted dashi with a heavy tasted ingredient, the taste of dashi becomes heavier than the ingredients, making the dish taste heavy.

#### ▼ Therefore

Use dashi and ingredients with similar strength of taste. For a delicate dish use a clear dashi and for a rich taste dish use a heavy flavored dashi.

#### ▼ Consequently

Umami from ingredients and the umami of dashi harmonize and creates a mild and gentle dish.

#### 〈Example of use〉

For delicate tastes such as soup-type appetizer and seasoned vegetables “ohitashi”, use a clear dashi. For strong tasted dishes such as curry udon noodle and chicken stew with taro “chikuzen-ni”, use dashi with a strong umami.



Curry udon noodle

## 14. Gradual Boiling

The flavor of ingredients melted into dashi has a satisfactory feeling to drink.

▼ In this context

When protein foods are boiled in hot dashi, flavor in ingredients do not transfer to dashi. By boiling protein foods with high temperature, it cooks from the outside, locking the umami inside.

▼ Therefore

Heat the ingredients in dashi at 20°C to 35°C. By slowly increasing the heat, dashi will soak through ingredients extracting more umami.

▼ Consequently

The taste will become rich with the flavor from ingredients. Dashi melted from ingredients mixed with the original dashi creates a 〈Combination of Richness〉. However, the flavor in ingredients will be lost.

〈Example of use〉

Ingredients for “arajiru” and “takikomi gohan” are boiled from cold dashi. With rich taste from ingredients melted, it becomes a filling cuisine.



Arajiru



Takikomi-gohan

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