

# Useful Petite Dish with Low Carbohydrate and Sufficient Protein for Various Situations

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## Abstract

Authors and collaborators have continued research and social movement on the Low Carbohydrate Diet (LCD) through Japan LCD Promotion Association (JLCDPA). Recommended 3 types of LCDs are petite-, standard-, super-LCD with 40%, 26%, 12% of carbohydrate ratio, respectively. Concerning the meal tolerance test (MTT), we have reported glucose and insulin responses to CR breakfast and LCD breakfast with 70g and 6g, respectively. This article described the tips for a useful dish with LCD and sufficient protein. It can be made of eggs, cheese, raw ham, and chicken by microwave cooking for 75 seconds. This petite dish can be applied in various situations.

**Keywords:** Low Carbohydrate diet, Weight loss effect, Meal tolerance test, Calorie restriction, HDL increase effect, Nutritional therapy, Diabetes, Diet, Petite dish.

**Abbreviations:** LCD: Low Carbohydrate diet; JLCDPA: Japan LCD promotion association; MTT: Meal Tolerance Test; CR: Calorie restriction.

## Introduction

In recent years, diabetes has been increasing across the world, and it has become a major medical and social problem in every region. Diabetes causes macroangiopathy and microangiopathy and affects the whole body, and then prevention is important(1). Therefore, to continue an adequate nutritional situation is crucial, and comparative studies of Calorie restriction (CR) and Low Carbohydrate Diet (LCD) have been conducted conventionally(2). For the study of the relationship of CR (low-fat diet) and LCD with mortality, it is necessary to investigate the detail of carbohydrate and fat in the actual meal. There was a prospective cohort study of US National Health and Nutrition Examination Survey with 37233 cases. As a result, unhealthy LCD and CR scores showed higher total mortality, whereas healthy LCD and CR scores showed lower total mortality(2).

There have been various papers concerning CR and LCD with various evidence(3). A recent report showed the systematic review from 12 systematic reviews, 10 meta-analyses. As a result, publication acceptance and citations seem to be larger effect sizes than methodological quality, and better quality RCTs and reviews would be necessary(3). In the recent RCT, the weight loss effect and the HDL increase effect of LCD were observed more than that of CR(4). In some papers on RCT research, beneficial clinical efficacy and effects of weight reduction and increased HDL-C value were found in LCD compared with that of CR(4,5). Further, LCD showed the probable beneficial efficacy for patients with insulin resistance, atherogenic dyslipidemia, and the frequently associated NAFLD in comparison with CR(6).

From the historical point of view, CR was been formerly rather performed for nutritional therapy for diabetes. Successively, LCD has been introduced to medical practice by Dr. Atkins and Dr. Bernstein(7,8). Due to their impressive books and lectures, LCD has been known to diabetes practice and also the general health care region in the United States and European countries.

On the other hand, a similar situation was gradually observed in Japan. Authors and collaborators have initiated LCD in Japan(9). We have developed clinical practice using LCD and continued diabetic research concerning CR and LCD. The themes of the research included a comparison of blood glucose profile in CR and LCD, Morbus (M) value calculated from glucose variability, insulin secretion differences between CR and LCD, elevated ketone bodies in the axis of the pregnant mother, newborn, placenta and fetus, and so on(10-12). Thus, various beneficial effects of ketone bodies have been known from basic and clinical points of view, which have been a close relationship with the development of LCD so far(13).

Authors' research group on LCD has continued not only clinical research but also the social movement of the LCD so far. We have established Japan LCD Promotion Association (JLCDPA) and developed a healthy way of life with LCD through many books, seminars, workshops, medical congress, and internet activities for a new era of diet therapy with LCD(14)). We have proposed three kinds of practical LCD meals for everybody to try and continue easily in their ordinary lives. They are petite-LCD, standard-LCD, and super-LCD, which contain carbohydrate ratio as 40%, 26%, and 12%, respectively(15). Applying super-LCD for 2773 patients with obesity in our research, weight reduction with 10% or more was observed in 666 (24.0%), showing remarkable efficacy(16).

There have been various patterns of diet so far. As an achievement of research on LCD, Shai et al. reported the comparison of CR, LCD, and the Mediterranean diet(17). Several types of the diet were compared such as LCD, CR, Vegetarian, High protein, Mediterranean, Dietary approach to stop hypertension (DASH), Low-glycemic index/load diet. Further, several evidence or index have been present, including DASH score,

Healthy Eating Index, Alternative Healthy Eating Index, which shows some emphases on vegetables, grains, nuts, fruits, legumes, and processed/refined foods(18).

In our research group, there have been two types of protocols concerning breakfasts. One is breakfast on CR that has been standard Japanese traditional meals with rice, according to the guideline of Japan Diabetes Association(19). It includes 70g of carbohydrate, and then we have reported the responses of insulin against the loading of the Carbo-70 method, with insulinogenic index (IGI)-Carbo 70(20). Successively, we developed the research of the C-peptide index for this meal tolerance test (MTT)(21). Another is the breakfast including only 6 g of carbohydrate, which was also reported as MTT(22). It consists of Omelet, tomato, broccoli, mayonnaise, and consommé soup, which has protein 14g, fat 24g, energy 300kcal. Though it includes only carbohydrate 6g, it can stimulate sufficient insulin secretion in normal subjects(22).

For the medical and social development of LCD, we have continued providing various tips for successful LCD lives to patients, medical staff, and ordinary people(23). One of the ideas would be a convenient and useful petite meal which can be made 1-2 minutes, containing almost no carbohydrate but much protein. An example is shown in Figure 1, which are 4 typical protein foods.

**Figure 1:** 4 typical protein foods



Their nutrients are calculated as Table 1, indicating less carbohydrate and enough protein.

**Table 1:** Nutrients of typical food.

| Nutrients of typical food |         |              |
|---------------------------|---------|--------------|
|                           | Protein | Carbohydrate |
|                           | (g)     | (g)          |
| Egg                       | 6.2     | 0.1          |
| Cheese                    | 3.7     | 0.2          |
| Raw ham                   | 1.8     | 0.1          |
| Chicken                   | 5.6     | 0.2          |

The recommended cooking method is as follows: i) Mix them with some cutting, ii) Put the ingredients in a cup, iii) Microwave it for 75-90 seconds for cooking, iv) Add spice powder to make it more delicious. Proposed petite dish has some characteristics, such as simple and economic benefits, popular palatability, and good digestibility.

In summary, LCD has been applied for beneficial methods in medical practice and health care region. The authors have continued research concerning LCD for long. This petite dish may be useful for single office workers on breakfast, for patients on a diet, and the younger generation in case of snacks. This article would be expected to become some references for developing LCD in various situations.

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