

## Dietary recommendations for immunosuppressed patients of 17 hematopoietic stem cell transplantation centers in Brazil

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**Introduction:** Low-microbial diets are recommended to reduce the risk of foodborne infections when hematopoietic stem cell transplantation patients have neutropenia. However there is no pattern concerning the composition of such a diet.

**Objectives:** To collect information concerning the structure of nutrition departments and the diets recommended for immunosuppressed patients in transplant centers in Brazil.

**Methods:** Questionnaires were sent to the 45 Bone Marrow Transplantation Centers listed by the Sociedade Brasileira de Transplante de Medula Óssea (SBTMO). Completed questionnaires were returned by 17 centers. The questions were related to the profile and the structure of the nutrition department, at what point a general diet is allowed after transplantation, and which food is allowed during the critical period of immunosuppression and soon after transplantation.

**Results:** Of the 17 centers that participated, 82% have a professional nutritionist exclusively for the Transplant Department but only 41% have an area specifically for the preparation of diets for immunosuppressed patients. The patients are released from the low-microbial diet to general diets 90-100 days after allogeneic hematopoietic stem cell transplantation by 29% of the centers and only after suspension of immunosuppressive drugs in 24%. Most centers (88%) restrict the consumption of raw fruits, all restrict the consumption of raw vegetables and 88% forbid the consumption of yogurt in the critical period of immunosuppression. There was no consensus on forbidden foods soon after transplantation.

**Conclusion:** Major differences in diets recommended to hematopoietic stem cell transplantation patients were observed between the different centers.

**Keywords:** Hematopoietic stem cells transplantation; Immunosuppression; Neutropenia; Diet/standards

### Introduction

Hematopoietic stem cell transplantation (HSCT) is the treatment procedure in which hematopoietic cells collected from the bone marrow, peripheral blood or umbilical cord are intravenously infused in patients with bone marrow failure with the aim of re-establishing hematopoiesis and the immune functions.<sup>(1-4)</sup> This procedure requires an initial ablation of the bone marrow through cytoreductive chemotherapy and/or intensive radiation.<sup>(1,5-8)</sup> Patients who undergo HSCT, especially those with complications such as Graft-versus-Host Disease (GVHD) may have anorexia, nausea and persistent vomiting, dysgeusia, mucositis, diarrhea and consequent insufficient oral intake of nutrients, with a worsening of their general and nutritional status.<sup>(1,9-11)</sup> Additionally, fluid and electrolyte disorders (sodium, potassium, calcium, phosphorus and magnesium) are frequent and may further affect the intestinal motility.<sup>(12)</sup>

After the preparative regimen, during the neutropenia phase, the patient becomes susceptible to foodborne infections.<sup>(13)</sup> Damage to the intestinal mucosa caused by chemotherapy and/or radiation may be a gateway for pathogens, a situation that may lead to bacteremia.<sup>(13-16)</sup> Infections can be prevented by controlling the ingestion of potential pathogens found in various food sources. Studies have identified gram-negative organisms, such as *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella* and *Proteus*, in different foods.<sup>(14)</sup>

Low-microbial diets (LMDs) are recommended in order to reduce the risk of infections through decreasing potentially pathogenic microorganisms in foods,<sup>(17,18)</sup> however there are no studies that show any reduction in the incidence of infections with the use of such diets.<sup>(19)</sup> These diets, commonly called "cooked food diets" have been used in many HSCT centers in Brazil and consist of the exclusion of raw foods (raw fruits and vegetables,

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raw meats and eggs, and unpasteurized dairy products) and of foods considered a higher risk of contamination.<sup>(13,18,20,21)</sup> The foods that have higher risk for patients submitted to HSCT are: raw eggs, unpasteurized dairy products (milk, cheese, butter, yogurt), raw tofu, matte tea, raw meat (including beef, chicken, pork, lamb), processed meats (sausage, bacon, baloney, and raw smoked meats), fruit juices and raw fruits, raw, unwashed and unpasteurized vegetables, unpasteurized honey, raw cereals, raw oleaginous fruits, tap water or water at high risk of contamination that is not boiled, ice made of tap water or water at risk of contamination, and meals from restaurants including fast-food.<sup>(22-26)</sup> The aim of this study was to collect information with the application of a questionnaire in respect to the standardization of diets for immunosuppressed patients after HSCT and the structure of nutrition departments in HSCT centers in Brazil.

## Methods

This was an observation and descriptive study carried out between June and October of 2009 and approved by the Ethics Research Committee of Hospital Erasto Gaertner in Curitiba (#1881).

This paper was based on data collected using a questionnaire that was sent to HSCT centers and answered by the nutritionists in charge. The questionnaires were mailed in August 2009, together with an informed consent form, to the head nutritionist of each center, with the permission of the Head of Service of the Bone Marrow Transplantation Department.

The inclusion criteria for participation in this study were that centers had at least one nutritionist responsible for transplant patients and that the centers would return the completed questionnaire.

The study sample involved the 45 Bone Marrow Transplantation Centers in Brazil listed by the *Sociedade Brasileira de Transplante de Medula Óssea* (SBTMO).<sup>(27)</sup> Responses were returned by only 17 centers, which participated in this study; two centers from the State of Rio Grande do Sul, one from Santa Catarina, three from Paraná, three from São Paulo, two from Rio de Janeiro, three from Minas Gerais, one from Goiás, one from Pernambuco and one from Rio Grande do Norte.

The questionnaire involved questions concerning information about the profile and the structure of the nutrition department, questions about the diet prescribed to HSCT patients, at what point the general diet is allowed after transplantation, and which food is allowed during the critical period of immunosuppression (CPI - from preparative regimen until engraftment or marrow recovery) and soon after transplantation (between being discharged from the hospital and 100 days after HSCT). These were objective multiple choice questions with different sections for beverages; bread, grains and cereals; dairy products; raw fruits and nuts; vegetables; beef, poultry, pork and fish; desserts; fats; and

others. They were divided in: allowed and allowed under some condition (foods that can only be eaten after going through some specific process, for instance cooking, boiling, pasteurization, vacuum packaging). In the literature there is no definition or recommendation for which fruits should be considered thin-skinned or thick-skinned and so in this paper fruits such as grapes, strawberries, mulberries and jaboticaba were considered thin-skinned.

The deadline for returning the questionnaires along with the duly signed consent form was 20 days after having received them. Some questions were divided in allogeneic or autologous HSCT because of the difference in the time and the severity of the neutropenia.

The answers were analyzed, tabulated in Excel (Microsoft) and the results presented as graphs and tables.

## Results

In relation to the number of beds, 6 (35%) centers have less than five beds, seven (41%) centers have between five and ten beds and three (18%) centers have more than ten beds. One center stated that they do not have beds specifically allocated for transplantation. All 17 (100%) centers perform autologous HSCT, 14 (82%) perform related allogeneic transplants and eight (47%) perform unrelated allogeneic transplants.

Two (12%) of the nutritionists interviewed graduated from college, 11 (65%) had post-graduations, three (18%) had master's degrees and one of the hospitals did not specify the professional training. Of the 17 centers analyzed, 14 (82%) have a professional nutritionist working exclusively in the Bone Marrow Transplantation Service and eight (47%) have trainees.

It was observed that only seven (41%) of the centers have an exclusive area for the preparation of food for immunosuppressed patients and only nine (53%) of the centers have employees who work exclusively in the preparation and distribution of the foods.

Fourteen (82%) centers reported using nutritional care protocols for patients undergoing HSCT and 13 (76%) have a protocol for indication and prescription of enteral and parenteral nutrition therapy.

In relation to the kind of diet prescribed to patients hospitalized for HSCT, one center (6%) prescribes a diet without raw fruits and vegetables and 16 (94%) prescribe LMDs.

There was a major difference as to the recommendation for when to discontinue the LMD (release to general diet) for patients submitted to allogeneic HSCT. Figure 1 shows that five (29%) of the centers release to general diet 90-100 days after HSCT, two (12%) recommend the release to general diet 120 after HSCT, one (6%) one year after HSCT, four (24%) only after discontinuing immunosuppressive medicines and one (6%) only releases for general diet after analyzing lab tests.

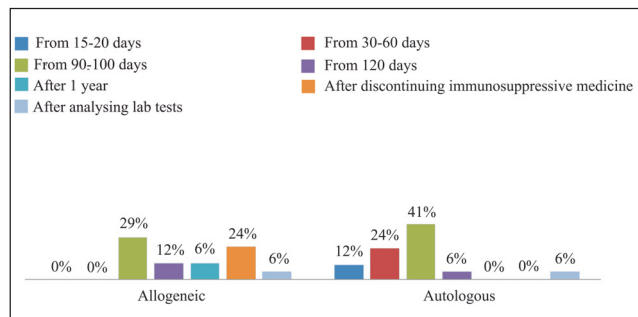


Figure 1 – Time to release to general diet for patients after allogeneic and autologous hematopoietic stem cell transplantation

For patients undergoing autologous HSCT, two (12%) centers recommend releasing patients to general diet 15-20 days after HSCT, four (24%) recommend releasing to general diet 30-60 days after HSCT, seven (41%) 90-100 days after HSCT, one (6%) 120 days after HSCT and one (6%) recommends it only after analyzing lab tests.

One center did not specify the time to releasing to general diet after allogeneic HSCT and autologous HSCT and two of the centers did not give a specific time for releasing to general diet for autologous HSCT.

Table 1 shows the foods that are not allowed during the CPI. From these foods we see that some foods/drinks,

Table 1 - Allowed and forbidden foods during the critical period of immunosuppression

	Forbidden n (%)	Allowed n (%)	Allowed under some conditions n (%)	Total allowed n (%)	No answer n (%)
Alcoholic beverages	17 (100)	-	-	-	-
Pasteurized fruit juice (packed in cartons)	1 (6)	15 (88)	-	15 (88)	1 (6)
Bread - whole meal or white	3 (18)	11 (65)	3 (18)	14 (82)	-
Flax and sesame seeds	17 (100)	-	-	-	-
Cooked cereals (ex: oatmeal)	-	17 (100)	-	17 (100)	-
Breakfast cereals	3 (18)	13 (76)	-	13 (76)	1 (6)
UHT Milk / milk powder/ pasteurized condensed milk	1 (6)	13 (76)	3 (18)	16 (94)	-
Fermented milk	16 (94)	1 (6)	-	1 (6)	-
Pasteurized yogurt	15 (88)	2 (12)	-	2 (12)	-
Ricotta cheese, white cheese	15 (88)	1 (6)	-	1 (6)	1 (6)
Grated cheese	10 (59)	3 (18)	4 (24)	7 (41)	-
Pasteurized cheese	5 (29)	9 (53)	3 (18)	12 (71)	-
Raw thick-skinned fruits	15 (88)	2 (12)	-	2 (12)	-
Raw thin-skinned fruits	17 (100)	-	-	-	-
Cooked fruits	-	17 (100)	-	17 (100)	-
Canned fruits	4 (24)	12 (71)	-	12 (71)	1 (6)
Nuts and roasted peanuts	16 (94)	1 (6)	-	1 (6)	-
Raw vegetables	17 (100)	-	-	-	-
Cooked vegetables	-	17 (100)	-	17 (100)	-
Canned vegetables	7 (41)	9 (53)	1 (6)	10 (59)	-
Dried herbs, spices and canned hearts of palm	11 (65)	-	6 (35)	6 (35)	-
Well cooked beef/ poultry/ eggs	-	17 (100)	-	-	-
Cooked ham	12 (71)	2 (12)	3 (18)	5 (29)	-
Sausage	12 (71)	5 (29)	-	5 (29)	-
Baloney/ salami	16 (94)	-	1 (6)	1 (6)	-
Cooked fish	2 (12)	15 (88)	-	15 (88)	-
Seafood	16 (94)	1 (6)	-	1 (6)	-
Homemade pies and cakes with or without filling	14 (82)	2 (12)	1 (6)	3 (18)	-
Commercial pies and cakes with or without filling	16 (94)	1 (6)	-	1 (6)	-
Custards/ Ice-creams	2 (12)	15 (88)	-	15 (88)	-
Chocolates	7 (41)	9 (53)	1 (6)	10 (59)	-
Industrialized honey	11 (65)	5 (29)	1 (6)	6 (35)	-
Molasses	17 (100)	-	-	-	-
Brown Sugar	10 (59)	6 (35)	1 (6)	7 (41)	-
Olives	11 (65)	5 (29)	1 (6)	6 (35)	-
Frozen food (industrialized)	12 (71)	4 (24)	1 (6)	5 (29)	-
Meals prepared at fast food restaurants	17 (100)	-	-	-	-

such as alcoholic beverages, flax/sesame seed, raw thin-skinned fruits, raw vegetables, molasses and meals at fast food restaurants are not recommended during CPI by any of the participating centers.

Some foods, such as industrialized and homemade pies/cakes, seafood, sausages (baloney, salami, ham), oleaginous fruits (nuts, peanuts), fermented milk, yogurts, honey, frozen foods and raw thick-skinned fruits, although not completely forbidden, are restricted during CPI in most of the HSCT centers.

Table 2 shows the foods that are allowed at hospital discharge to 100 days after HSCT.

In comparison with the CPI, the diet becomes less restrictive. A major difference was found concerning the release time for the consumption of raw fruits and vegetables as 59% of the centers forbid the consumption of thin-skinned fruits (grapes, strawberries, mulberries and jaboticaba) and 35% forbid raw vegetables until 100 days after HSCT. Another major difference among the centers is the release time for the consumption of yogurts (59% centers forbid the consumption of yogurts and 71% forbid the consumption of fermented milk) and processed meats (47% of the centers forbid the consumption of cooked ham and 53% forbid the consumption of sausage).

Table 2 - Allowed and forbidden foods at hospital discharge to 100 days after hematopoietic stem cell transplantation

	Forbidden n (%)	Allowed n (%)	Allowed under some conditions n (%)	Total allowed n (%)	No answer n (%)
Alcoholic beverages	17 (100)	-	-	-	-
Pasteurized fruit juice (packed in cartons)	-	16 (94)	-	16 (94)	1 (6)
Bread - whole meal or white	1 (6)	16 (94)	-	16 (94)	-
Flax and sesame seeds	6 (35)	11 (65)	-	11 (65)	-
Cooked cereals (ex: oatmeal)	-	17 (100)	-	17 (100)	-
Breakfast cereals	-	16 (94)	-	16 (94)	1 (6)
UHT Milk / milk powder/ pasteurized condensed milk	-	17 (100)	-	17 (100)	-
Fermented milk	12 (71)	5 (29)	-	5 (29)	-
Pasteurized yogurt	10 (59)	7 (41)	-	7 (41)	-
Ricotta cheese, white cheese	6 (35)	11 (65)	-	11 (65)	-
Grated cheese	3 (18)	14 (82)	-	14 (82)	-
Pasteurized cheese	1 (6)	16 (94)	-	16 (94)	-
Raw thick-skinned fruits	1 (6)	16 (94)	-	16 (94)	-
Raw thin-skinned fruits	10 (59)	7 (41)	-	7 (41)	-
Cooked fruits	-	17 (100)	-	17 (100)	-
Canned fruits	2 (12)	15 (88)	-	15 (88)	-
Nuts and roasted peanuts	6 (35)	11 (65)	-	11 (65)	-
Raw vegetables	6 (35)	11 (65)	-	11 (65)	-
Cooked vegetables	-	17 (100)	-	17 (100)	-
Canned vegetables	3 (18)	13 (76)	-	13 (76)	1 (6)
Dried herbs, spices and canned hearts of palm	2 (12)	14 (82)	-	14 (82)	1 (6)
Well cooked beef/ poultry/ eggs	5 (29)	11 (65)	-	11 (65)	1 (6)
Cooked ham	-	17 (100)	-	17 (100)	-
Sausage	8 (47)	9 (53)	-	9 (53)	-
Baloney/ salami	9 (53)	8 (47)	-	8 (47)	-
Cooked fish	11 (65)	5 (29)	1 (6)	6 (35)	-
Seafood	13 (76)	3 (18)	1 (6)	4 (24)	-
Homemade pies and cakes with or without filling	-	17 (100)	-	17 (100)	-
Commercial pies and cakes with or without filling	11 (65)	6 (35)	-	6 (35)	-
Custards/ Ice-creams	2 (12)	15 (88)	-	15 (88)	-
Chocolates	12 (71)	5 (29)	-	5 (29)	-
Industrialized honey	-	17 (100)	-	17 (100)	-
Molasses	6 (35)	11 (65)	-	11 (65)	-
Brown Sugar	11 (65)	6 (35)	-	6 (35)	-
Olives	3 (18)	14 (82)	-	14 (82)	-
Frozen food (industrialized)	9 (53)	8 (47)	-	8 (47)	-
Meals prepared at fast food restaurants	11 (65)	6 (35)	-	6 (35)	-

## Discussion

According to Justino,<sup>(13)</sup> HSCT centers should adopt nutrition protocols in order to avoid that food, which costs very little in comparison with other procedures of the treatment, might be responsible for introducing microorganisms that are potentially pathogenic, into the gastrointestinal tract.

It is clear that the release time to a general diet recommended by professionals varies much between centers. How long the patient will have to remain on a special controlled diet depends on his immunosuppression and on the type of transplant involved.<sup>(13)</sup> Some Brazilian authors recommend that LMDs should be extended to up to 100 days for patients undergoing autologous HSCT and during immunosuppression for those submitted to allogeneic HSCT, i.e., up to 60 days after the procedure. However, other authors suggest that for allogeneic HSCT, the diet must continue until the end of all immunosuppressive therapy, and for autologous HSCT, the diet should continue until one month after the discontinuation of corticosteroids or three months after chemotherapy in the absence of gastrointestinal symptoms.<sup>(1,9,13)</sup>

Although there is some reference for healthcare professionals on forbidden foods for the patient after HSCT, this study shows that there are still some differences among professionals concerning which foods are allowed, especially during CPI.

In the international literature some foods, such as yogurt and cheese, are allowed during CPI as long as they have been pasteurized however in most of the participating centers (88%) the consumption of these foods is not allowed. The same is true for thin-skinned fruits which are allowed during CPI according to literature as long as they have been properly washed before consumption, however, most of these centers forbid them (88%). Another food that raises doubts is chocolate, forbidden by 41% of the centers during CPI; however there are no guidelines that prohibit its consumption during CPI.

This survey shows that most HSCT centers do not have an area exclusively for the preparation of food for immunosuppressed patients and many of them do not have employees working exclusively in the preparation and distribution of the meals. It was also observed that, because of the nonexistence of a standard diet for patients after HSCT, each participating center has its own nutrition protocol based on scarce published data and on professional experience.

During the research it was found that most centers recommended LMDs; there were, however, many different results concerning food recommendations. Many different opinions were found in relation to the release time to general diet and there was no consensus in this matter.

Therefore, although there are some publications concerning this subject, data to support the professionals

who work in this area are still very scarce making it unsafe to recommend foods that can be ingested by patients after HSCT. In this scenario, a national standard for the diet of such patients would be ideal as a tool to aid professional nutritionists.

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APPENDIX 1 - QUESTIONNAIRE

1) Identification

Hospital: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Number of Beds in the Bone Marrow Transplantation Service: \_\_\_\_\_

Types of HSCT performed by the service:

Autologous

Allogeneic Related

Allogeneic Unrelated

Nutritionist in charge of the Bone Marrow Transplantation Service: \_\_\_\_\_

Professional Training (Post-graduation and courses in the area of expertise): \_\_\_\_\_

How many nutritionists work exclusively in the Bone Marrow Transplantation Service? \_\_\_\_\_

How many trainee nutritionists work in the Bone Marrow Transplantation Service? \_\_\_\_\_

2) Questionnaire

a) In this hospital, is there an area exclusively for the preparation of food for immunosuppressed patients?

Yes  No

P.S.: \_\_\_\_\_

b) Are there employees working exclusively in the preparation and distribution of these diets?

Yes, number of employees: \_\_\_\_\_ total number of employees per shift: \_\_\_\_\_

No

P.S.: \_\_\_\_\_

c) Are there nutritional protocols for patients undergoing HSCT?

Yes  No

P.S.: \_\_\_\_\_

d) Are there recommendations and prescription protocols for enteral nutrition and total parenteral nutrition?

Yes  No

P.S.: \_\_\_\_\_

e) What kind of diet is prescribed to inpatients who are admitted into the hospital for HSCT?

Unrestricted diet

Free diet without raw fruits and vegetables

Low-microbial diet

Sterile diet

Other: \_\_\_\_\_

f) After HSCT, at what time is the patient allowed to eat a general diet? \_\_\_\_\_

g) According to the nutritional conducts of the hospital, check the foods permitted to patients in the critical period of immunosuppression after HSCT (period of hospital stay) and soon after HSCT (from hospital discharge until 100 days after HSCT): \_\_\_\_\_

1) Beverages	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Instant coffee	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Matte tea	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Herb teas in general	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Industrialized ready-to-drink teas (in cans or bottles)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Isotonic drinks (Gatorade, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mineral water/MineralIce	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pasteurized fruit juice (packed by Tetra Pak)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fruit juice concentrate	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fresh fruit juice	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Soda/Carbonated drinks in general	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Alcoholic beverages	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

2) Bread, grains and cereals	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Bread - whole meal or white	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Baguettes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pitta bread	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cheese bread	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Muffins	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Industrialized cake	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Waffles	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cookie with filling	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Toast	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pancakes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potato chips	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Farofa	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Tapioca	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Corn couscous	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Corn flour or toasted manioc	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Breakfast cereals	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chips such as Cheetos	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen pizza	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Popcorn	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen pasta	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fresh dough for pasta, pastry or pizza	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fresh stuffed pasta	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked cereals (ex: oatmeal)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cold cereals without nuts or fruit (ex. granola)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cereal bar	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Deep fried pastries	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pastry	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Flax seeds, sesame	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

3) Dairy products	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Pasteurized cheese (cheddar, mozzarella, Parmesan, cream cheese etc)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Unpasteurized cooked cheese (brie, Camembert, Roquefort, homemade cheese)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pasteurized yogurt (including those with fruits and live lactobacillus - probiotics)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fermented milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Curd cheese	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Grated cheese	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pasteurized milk (packet)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
UHT Milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Milk powder	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pasteurized cream milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pasteurized condensed milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Dulce de leche	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sour cream (pasteurized)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Coalho cheese	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ricotta cheese, white cheese	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

4) Raw fruits and nuts	Critical period of Immunosuppression	Hospital discharge, 100 days after HSCT
Banana	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Watermelon	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Melon	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Avocado	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Orange	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Tangerine	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Lemon	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Passion fruit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pineapple	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Apple	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Papaya	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mango	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Nectarine	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Plum	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Grapes	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Kiwi	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pear	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Peach	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Strawberry	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mulberry	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Jaboticaba	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fig	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Persimmon	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Guava	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Custard apple	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Lychee	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Candied fruit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Canned fruit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked fruit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen fruit pulp	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Dried fruit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Nuts and roasted peanuts	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

5) Vegetables	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Tomato	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Capsicum	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Carrot	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Beetroot	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cucumber	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Radish	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cabbage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Lettuce	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Kale	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Watercress	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chard	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked vegetables (potato, green beans, eggplant, etc)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Canned hearts of palm	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Canned vegetables	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Dried herbs and spices	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

6) Beef, pork, poultry and fish	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Well-cooked beef and poultry	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Well-cooked fish	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Canned fish (tuna, sardine)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Well-done pork	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen hamburger	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Giblets (heart, gizzard, liver)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen breaded beef (ex. steak)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen breaded chicken	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Bacon, lard, cracklings	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sausage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Industrialized pate	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked hot dog sausage	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Salami	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked ham	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ham	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Baloney	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Boiled eggs with firm egg white and yolk	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pasteurized or cooked tofu	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked seafood (oysters, clams, squid, shrimp, etc)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

7) Desserts, cakes and candies	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Refrigerated commercial preparations (pies and cakes with fillings)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Refrigerated homemade preparations (pies and cakes with fillings)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Custard	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ice-cream	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Fruit Popsicle	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Candies, lollipops	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chewing gum	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mocoto Candy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Raw brown sugar	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cakes with frosting and filling	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Marshmallow, meringue	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Peanut and brown sugar candy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chocolates	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Chocolates with filling	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

8) Fats	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Vegetable Oils	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Margarine	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Butter	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Lard	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Mayonnaise and salad dressings	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cooked sauces	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		

9) Others	Critical period of immunosuppression	Hospital discharge, 100 days after HSCT
Industrialized honey	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Meals prepared in restaurants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Sandwiches prepared in fast food restaurants	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Frozen food (industrialized)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Salt	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
White sugar	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Brown sugar	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Jams and jellies	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Ketchup, mustard	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Soy sauce	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Vinegar	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Molasses	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Olives	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Comments:		