

## **Supplementary material**

Title: Subjective mouthfeel and temperature alterations in COVID-19 patients six to ten months after diagnosis

Chemosensory Perception

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**A. Questionnaire on sensory changes**

**Informed consent**

Thank you for your interest in this study.   
 Did you read the information above about this study and do you agree with this?

**Patient characteristics**

Q1a. What is your age?

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**< 18? RESPONDENT IS FINISHED**

Q1b. What is your gender?

**CIRCLE ONE CODE ONLY**

	Male	1
	Female	2
	Other	3

Q1c. In which month have you been positively tested for the Coronavirus?

**CIRCLE ONE CODE ONLY**

	February 2020	1	<b>CONTINUE TO Q1d</b>
	March 2020	2	
	April 2020	3	
	May 2020	4	
	June 2020	5	
	July 2020	6	
	Later than July 2020	7	<b>RESPONDENT IS FINISHED</b>
	I don't have a positive corona test	8	

Q1d.	Have you been admitted in the hospital due to your corona infection?		
<b>OMCIRKEL SLECHTS ÉÉN ANTWOORD</b>			
	Yes, on the Intensive Care	1	<b>CONTINUE TO Q1e</b>
	Yes, on the nursing department	2	
	No	3	<b>SKIP TO Q1f</b>

Q1e.	How many days have you been admitted in the hospital due to your corona infection?
<b>OPEN QUESTION</b>	

Q1g.	Do you have other diseases for which you are treated with medication?
<b>OPEN QUESTION</b>	

**Taste, smell, texture and temperature changes**

Q2a.	How has your <b>sense of smell</b> changed compared to before being positively tested for the corona virus, even if just a little?		
	<b>CIRCLE ONE CODE ONLY</b>		
	I do not perceive any smell at all	1	<b>CONTINUE TO Q2b</b>
	I perceive a difference in intensity of smells in general/lack of smell ( smell acuity )	2	
	I don't perceive food smells in the same way I did before (smell alteration)	3	
	I detect new bad smells	4	
	I did have changes in smell, but not anymore	5	<b>SKIP TO Q3a</b>
	I do not perceive any <u>change</u> in smell perception	6	

Q2b.	<b>ONLY ASK THOSE WHO SELECTED 1-4 IN Q2a</b>			
	Thinking about the things that have changed your <b>sense of smell</b> , how much does it impact your daily life?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
Smell	1	2	3	4

Q2c.	Thinking about the things that have changed your <b>sense of smell</b> , is your quality of life negatively affected because of these changes in taste?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
Smell	1	2	3	4

Q3a.	How has your <b>sense of taste</b> changed compared to before being positively tested for the corona virus, even if just a little?		
<b>CIRCLE ALL THAT APPLY</b>			
	I do not perceive any taste anymore	1	<b>CONTINUE TO Q3b</b>
	I perceive a difference in intensity of tastes in general (lack of taste)	2	
	I don't perceive certain tastes the same way I did before (taste alteration)	3	
	I detect new bad tastes in my mouth	4	<b>SKIP TO Q4a</b>
	I did have changes in taste, but not anymore	5	
	I do not perceive any <u>change</u> in taste perception	6	

Q3b.	<b>ONLY ASK THOSE WHO SELECTED 1-4 IN Q3a</b>				
	Thinking about the things that have changed your <b>sense of taste</b> (e.g. sweet, salt, sour, bitter, metallic taste), how much does it impact your daily life?				
<b>CIRCLE ONE CODE ONLY</b>					
		Not at all	A little	Quite a bit	Very much
	Taste	1	2	3	4

Q3c.	Thinking about the things that have changed your <b>sense of taste</b> (e.g. sweet, salt, sour, bitter, metallic taste), is your quality of life negatively affected because of these changes in taste?				
	<b>CIRCLE ONE CODE ONLY</b>				
		Not at all	A little	Quite a bit	Very much
	Taste	1	2	3	4

Q4a.	How has your <b>sense of mouthfeel</b> , changed compared to before being positively tested for the corona virus, even if just a little?		
<b>CIRCLE ALL THAT APPLY</b>			
	I perceive mouthfeel different than before	1	<b>CONTINUE TO Q4b</b>
	I do perceive a dry mouth	2	
	I prefer other textures (e.g. thicker/thinner) than before	3	
	I don't feel the tingling sensation of carbonated drinks anymore	4	<b>SKIP TO Q5a</b>
	I did have changes in mouthfeel, but not anymore	5	
	I do not perceive any <u>change</u> in mouthfeel perception	6	

Q4b.	<b>ONLY ASK THOSE WHO SELECTED 1-4 IN Q4a</b> Thinking about the things that have changed your <b>sense of mouthfeel</b> (e.g. dry mouth feelings, temperature perception), how much does it impact your daily life?  <b>CIRCLE ONE CODE ONLY</b>			
		Not at all	A little	Quite a bit
Mouthfeel	1	2	3	4

Q4c.	Thinking about the things that have changed your <b>sense of mouthfeel</b> (e.g. dry mouth feelings, temperature perception), is your quality of life negatively affected because of these changes in taste?  <b>CIRCLE ONE CODE ONLY</b>			
		Not at all	A little	Quite a bit
Mouthfeel	1	2	3	4

Q5a.	Do you have a change in preference on the <b>specific temperature at which food and drinks are served</b> , compared to before being positively tested for the corona virus, even if just a little?  <b>CIRCLE ALL THAT APPLY</b>			
	Yes, I prefer frozen now	1	<b>CONTINUE TO Q5b</b>	
Yes, I prefer chilled (fridge temperature) now	2			
Yes, I prefer ambient temperature now (around 20 degree Celsius)	3			
Yes, I prefer a little warmer now	4			
Yes, I prefer hot now	5			
My preferences was changed, but not anymore	6			
No, it remains the same	7			

Q5b.	<b>ONLY ASK THOSE WHO SELECTED 1-4 IN Q5a</b> Thinking about the things that have changed your <b>specific temperature at which food and drinks are served</b> , how much does it impact your daily life?  <b>CIRCLE ONE CODE ONLY</b>			
		Not at all	A little	Quite a bit
Temperature	1	2	3	4

Q5c.	Thinking about the things that have changed your <b>specific temperature at which food and drinks are served</b> , is your quality of life negatively affected because of these changes in taste?  <b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
Temperature	1	2	3	4

- **IF RESPONDENT HAS SELECTED CODES 1-4 AT Q2a, ASK QUESTION Q6a.**
- **IF RESPONDENT HAS SELECTED CODE 5 AT Q2a AND IF RESPONDENT HAS SELECTED CODES 1-4 AT Q3a, ASK QUESTION Q7a.**
- **IF RESPONDENT HAS SELECTED CODE 5 AT Q2a AND Q3a, THE QUESTIONNAIRE IS COMPLETED.**

## Smell

**RESEARCHER: ASK QUESTION Q6a IF RESPONDENT HAS SELECTED CODES 1-4 AT Q2a (SMELL PERCEPTIONS HAVE CHANGED).**

Q6a.	Thinking about your experiences of eating and drinking <b>since you have been tested positive for the corona virus</b> , to what level of severity did your smell perception change?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
a. Smell	1	2	3	4
		<b>CONTINUE TO Q6b</b>		

Q6b.	<b>ONLY ASK THOSE WHO SELECTED 2-4 IN Q6a</b>					
	How is the <b>course</b> of the smell changes since you have been tested positive for the corona virus?					
	<b>CIRCLE ONE CODE ONLY</b>					
	It decreases / I'm almost back at my old level.	It decreases a little	Stable	Increases a little	Increases	Fluctuating
Course	1	2	3	4	5	6

Q6c.	Do you have continuous nasal congestion since you have been tested positive for the corona virus?	
	<b>CIRCLE ONE CODE ONLY</b>	
	No	1
	At the start, but not anymore	2
	Yes	3



Q6d. Generally, what do you do to cope with bad or distorted smells?

**CIRCLE ALL THAT APPLY**

I don't have bad or distorted smells	1	
Nothing	2	
I choose colder foods (sandwiches, salads, fruits, and cheeses) that are less aromatic	3	
I open the windows and use the exhaust fan when cooking; open containers away from the face	4	
I eat other types of food that have smells I can bear	5	
Other, please specify: _____	6	

Q6e. Generally, what do you do to cope with diminished smell?

**CIRCLE ALL THAT APPLY**

I don't have a diminished smell	1	
Nothing	2	
I check more often if the gas is turned off	3	
I smell at products to check if I do smell something	4	
I ask other people to smell at possible rotten foods	5	
I pay more attention on personal hygiene (putting on clean clothes, extra deodorant)	6	
Other, please specify: _____	7	

Q6f. Can you please specify what, if any, odors you feel more sensitively than before?

**CIRCLE ALL THAT APPLY**

	<b>Q12c</b>	
Cleaning products	1	
Perfume	2	
Odor of the hospital room	3	
Fish	4	
Dairy (milk)	5	
Meat	6	
Acidic fruit	7	
Sweet fruits	8	
Savory	9	
Food cooking	10	
Other, please specify:_____	11	
None	12	

- IF RESPONDENT HAS SELECTED CODES 1-4 AT Q3a, ASK QUESTION Q7a.

- IF RESPONDENT HAS SELECTED CODE 5 AT Q3a, ASK QUESTION Q14

**TASTE**

**RESEARCHER: ASK QUESTION Q7a IF RESPONDENT HAS SELECTED CODES 1-4 AT Q3a (TASTE PERCEPTIONS HAVE CHANGED).**

Q7a.	Thinking about your experiences of eating and drinking <b>since you have been tested positive for the corona virus</b> , to what level of severity did your taste perception change?  <b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
a. Taste (e.g. sweet, salty, sour, bitter, metallic etc.)	1	2	3	4
	<b>SKIP TO Q14</b>		<b>CONTINUE TO Q7b</b>	

Q7b.	<b>ONLY ASK THOSE WHO SELECTED 2-4 IN Q7a.</b>  How is the <b>course</b> of the taste changes since you have been tested positive for the corona virus?  <b>CIRCLE ONE CODE ONLY</b>					
	It decreases / I'm almost back at my old level.	It decreases a little	Stable	Increases a little	Increases	Fluctuat ing
Course	1	2	3	4	5	6

Q7c.	Generally, what do you do to cope with the <b>change in taste intensity</b> ?  <b>CIRCLE ALL THAT APPLY</b>	
	Nothing	1
	Experiment with stronger flavors such as spices and marinades	2
	Avoid stronger flavors, like not adding spices or pepper	3
	Choose soft foods such as baked chicken, potatoes, pasta and rice	4
	Consume foods with high moisture or water content	5
	Add sauces or gravy to moisten foods	6
	Other, please specify:.....	7

Q8a.	We would now like to ask you a bit more specifically about certain defined tastes. To what extent has the following <b>taste changed in intensity</b> for you?				
	<b>CIRCLE ONE CODE ONLY</b>				
	Much stronger	Slightly stronger	No change	Slightly weaker	Much weaker / cannot taste it at all
A change in things that normally would taste <b>salty</b>	1	2	3	4	5
	<b>CONTINUE TO Q8b</b>		<b>SKIP TO Q9a</b>	<b>CONTINUE TO Q8b</b>	

Q8b.	<b>ONLY ASK THOSE WHO SELECTED CODES 1, 2, 4 OR 5 at Q8a</b>			
	How much does the <b>change in salty taste</b> impact you?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
<b>Salty taste</b>	1	2	3	4
	<b>SKIP TO Q9a</b>	<b>CONTINUE TO QUESTION Q8c</b>		

	<b>ONLY ASK THOSE WHO SELECTED CODES 2-4 at Q8b</b>	
Q8c.	What do you do to cope with this change in <b>salty taste</b> ?	
	<b>CIRCLE ALL THAT APPLY</b>	
	Nothing	1
	I limit salty foods and foods with added salt	2
	I do not add salt during the cooking process or after meal preparation	3
	I add fish sauce or soy sauce to the food	4
	I add additional salt to the food	5
	I add more chicken essence / chicken powder to the food	6
	Other, please specify: _____	7

Q9a.	To what extent has the following taste changed in intensity for you?				
	<b>CIRCLE ONE CODE ONLY</b>				
	Much stronger	Slightly stronger	No change	Slightly weaker	Much weaker / cannot taste it at all
A change in things that normally would taste <b>bitter</b>	1	2	3	4	5
	<b>CONTINUE TO Q9b</b>		<b>SKIP TO Q10a</b>	<b>CONTINUE TO Q9b</b>	

Q9b.	<b>ONLY ASK THOSE WHO SELECTED CODES 1, 2, 4 OR 5 at Q9a</b>			
	How much does the <b>change in bitter taste</b> impact you?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
<b>Bitter taste</b>	1	2	3	4
	<b>SKIP TO Q10a</b>	<b>CONTINUE TO QUESTION Q9c</b>		

Q9c.	<b>ONLY ASK THOSE WHO SELECTED CODES 2-4 at Q9b</b>		
	<b>ASK AS OPEN QUESTION</b>		
	What do you do to cope with this change in <b>bitter taste</b> ?		
	<b>CIRCLE ALL THAT APPLY</b>		
	Nothing	1	
	I eat room-temperature or cold foods	2	
	I limit intake of bitter products	3	
	I try to make my food more sour (adding lime, lemon, vinegar or other)	4	
	Other, please specify: _____	5	

Q10a.	To what extent has the following taste changed in intensity for you?				
	<b>CIRCLE ONE CODE ONLY</b>				
	Much stronger	Slightly stronger	No change	Slightly weaker	Much weaker / cannot taste it at all
A change in things that normally would taste <b>sweet</b> .	1	2	3	4	5
	<b>CONTINUE TO Q10b</b>		<b>SKIP TO Q11a</b>	<b>CONTINUE TO Q10b</b>	

Q10b.	<b>ONLY ASK THOSE WHO SELECTED CODES 1, 2, 4 OR 5 at Q10a</b>			
	How much does the <b>change in sweet taste</b> impact you?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
<b>Sweet taste</b>	1	2	3	4
	<b>SKIP TO Q11a</b>	<b>CONTINUE TO QUESTION Q10c</b>		

<b>ONLY ASK THOSE WHO SELECTED CODES 2-4 at Q10B.</b>		
Q10c.	What do you do to cope with this change in sweet taste?	
	<b>CIRCLE ONE CODE ONLY</b>	
	Nothing	1
	I limit sweet foods and foods with added sugar	2
	I add salt to sweet food	3
	I add more water to make the food less sweet	4
	I add sugar into the food	5
	I add sweeteners into the food such as strawberries, vanilla, etc.	6
	Other, please specify: _____	7

Q11a.	To what extent has the following taste changed in intensity for you?				
	<b>CIRCLE ONE CODE ONLY</b>				
	Much stronger	Slightly stronger	No change	Slightly weaker	Much weaker / cannot taste it at all
A change in things that normally would taste <b>sour</b> .	1	2	3	4	5
	<b>CONTINUE TO Q11b</b>		<b>SKIP TO Q12a</b>	<b>CONTINUE TO Q11b</b>	

Q11b.	<b>ONLY ASK THOSE WHO SELECTED CODES 1, 2, 4 OR 5 at Q11a</b>			
	How much does the <b>change in sour taste</b> impact you?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
<b>Sour taste</b>	1	2	3	4
	<b>SKIP TO Q12a</b>	<b>CONTINUE TO QUESTION Q11c</b>		

<b>ONLY ASK THOSE WHO SELECTED 2-4 AT VRAAG Q11b.</b>		
Q11c.	What do you do to cope with this change in sour taste?	
	<b>CIRCLE ALL THAT APPLY</b>	
	Nothing	1
	I limit sour foods such as citrus fruits.	2
	I add sugar into the food to make it less sour.	3
	I try to make the food more sour (adding lime, lemon, vinegar)	4
	Other, please specify: _____	5

Q12a.	Do you experience any <b>metallic tastes</b> (e.g. imagine if you bite a key / smell your finger after you hold a key for a while) compared to before infection with the corona virus?	
	<b>CIRCLE ONE CODE ONLY</b>	
	No	1
	Yes, I experience it without being presented with a food product	2
	Yes, I experience it only when being presented with a food product	3
		<b>SKIP TO Q13a</b>
		<b>CONTINUE TO Q12b</b>

Q12b.	<b>ONLY ASK THOSE WHO SELECTED 2-3 IN Q12a</b>			
	Thinking about the things that make you experience any <b>metallic tastes</b> , how much does it impact your daily life?			
<b>CIRCLE ONE CODE ONLY</b>				
	Not at all	A little	Quite a bit	Very much
Metallic tastes	1	2	3	4
	<b>SKIP TO Q13a</b>	<b>CONTINUE TO Q12c</b>		

Q12c.	<b>ONLY ASK THOSE WHO SELECTED CODES 2-4 at Q12b</b>		
	What do you do to cope with this change in <b>metallic sensation</b> ?		
<b>CIRCLE ALL THAT APPLY</b>			
	Nothing	1	
I limit red meat, liver, intestine, and other foods high in iron		2	
I experiment with other high-protein food choices such as egg, poultry, fish, beans and soy		3	
I use plastic utensils instead of metal		4	
I avoid consuming foods from metal cans and/or avoid cooking in an iron skillet		5	
Other, please specify: _____		6	

Q13a.	Patients may experience a continuous taste in their mouth. Have you experienced a <b>continuous taste</b> in your mouth that you did not experience before your infection with the corona virus?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
Continuous taste	1	2	3	4
		<b>CONTINUE TO Q13b</b>		



Q13b.	<b>ONLY ASK THOSE WHO SELECTED 2-4 IN Q13a</b>			
	Thinking about the things that make you experience any <b>continuous taste</b> , how much does it impact your daily life?			
	<b>CIRCLE ONE CODE ONLY</b>			
	Not at all	A little	Quite a bit	Very much
Continuous taste	1	2	3	4

13c.	Thinking about the things that make you experience any <b>continuous tastes</b> , which resembles this taste?	
	<b>CIRCLE ALL THAT APPLY</b>	
1	Blood	
2	Bitter	
3	Something chemical	
4	Something musty	
5	Drugs	
6	Metallic	
7	Sweet	
8	Salty	
9	Sour	
10	Other, please specify _____	

Q14.	<b>ONLY ASK THOSE WHO SELECTED 1-4 IN Q2a and/or Q3a</b>	
	Would you like more guidance for your changes in smell of taste? If yes, what kind of guidance?	
	<b>CIRCLE ALL THAT APPLY</b>	
	No	1
	I would like a medicament (experimental) treatment	2
	I would like to receive more information about smell and taste changes	3
	I would like to receive help from a dietitian to advise me on adapting my food to my changes in smell and taste	4
	I would like to have my family receiving more information about my smell and taste changes	5
I would like (more) peer support	6	
Other, please specify: _____	7	