THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

**School of Biological Sciences**

**Human Nutrition Unit**
The University of Auckland
18 Carrick Place, Mt Eden
Auckland, 1024.
Phone: +64 9 630 1162

# The influence of gender and the oral contraceptive pill on acute protein induced thermogenesis

## PARTICIPANT INFORMATION SHEET

We invite you to participate in a research study to investigate the effect of the gender and also the combined oral contraceptive pill (OCP) on acute protein-induced thermogenesis. Thermogenesis is the means by which our bodies generate heat whilst using energy to process and store nutrients from the food we eat after meals. This accounts for about 10% of the energy we expend every day. However, there is a large variation between individuals which may contribute to a person's risk of developing obesity. The OCP is a very common type of female contraception. It is normally just called "The Pill".

This study aims to better understand the differences between men and women, and the effect of the OCP, on thermogenesis after meals containing different protein levels. In addition, we will investigate if rate at which the stomach empties into the small intestine influences thermogenesis, by measuring levels of paracetamol given with the test meals, as nearly all paracetamol is absorbed in the body through the intestine rather than the stomach.

To help us understand the effect of gender and the OCP on thermogenesis, the study will involve taking certain measurements from men, women not taking the OCP, and women taking the OCP, during both the active phase of OCP use (21-day hormonal pills) and the inactive phase (7-day sugar pills).

Your participation is voluntary (your choice). If you do agree to take part, you are free to withdraw from the study at any time, without having to give a reason. If you do withdraw from the study, you can decide if you permit researchers to use any information or blood samples already collected. You may take as much time as you need to consider whether you would like to participate.

## 1. Who can take part?

You can participate in this research if you, aged between 18 and 40 years of age, with a body mass index (BMI) (BMI=weight/height$^2$) of between 18.5 and 27kg/m$^2$, and are healthy. You should not have a diagnosis of diabetes or any other significant disease, including cardiovascular disease, pancreatic disease, cancer and digestive diseases. You must not be taking any other medications/supplements, suffer from claustrophobia or be allergic to paracetamol.

If you are a woman taking an OCP (e.g. Ava, Brevinor, Loette, Microgynon, Norimin, Yasmin, Yaz), you must take it according to manufacturer instructions (i.e. take all 28 of the pills in the pack and have a regular period) for at least three months prior to enrolling in the study and you must continue to take the pill for the duration of the study. Women not taking the OCP must not be pregnant or breastfeeding, should not have used a hormonal method of contraceptive for at least 3 months, and have regular periods.

## 2. Background to the study

Even though the positive effect of dietary protein on thermogenesis and satiety has generated interest in its role in weight control, the relationship between gender, hormonal contraception and protein-induced thermogenesis is not yet fully understood. This study will examine the effect of differing protein levels contained in the test meals on thermogenesis in women of child-bearing age who are either taking and/or not taking the pill, and men of a similar age.

The OCP is known to regulate the menstrual cycle by the use of hormones, containing 21 days of active (hormonal) pills, and 7 days of inactive (placebo) pills. In this study women on the pill will undergo testing at the end of both the hormonal pill phase, and the inactive pill phase to determine whether there are differences in thermogenesis between these phases when using the OCP. Women not taking the pill will be tested in the week prior to menstruation (luteal phase), and men will be tested at their convenience. For each group, this will determine if, and by how much, the thermogenic response varies across a range of protein levels, and also reveal potential differences in thermogenesis between the three groups. In addition to monitoring of energy use using a machine called a calorimeter, body temperature will be taken, and blood tests used to measure things like insulin, and cholesterol.

The results gained from this study will increase our understanding of the effect of the gender and OCP on thermogenesis after meals of varying protein content. We hope the results will improve obesity treatment/prevention strategies.

## 3. Who designed the study?

The study is part of a larger research project and is funded by the Health Research Council of New Zealand (HRC Grant 17/009; Sir Charles Hercus Fellowship). The study is designed by research staff at the School of Biological Sciences (SBS) and the Human Nutrition Unit (HNU), University of Auckland. Data from the study will also contribute to the PhD research programme of Julia Cree.

## 4. Your time on the study

Men and women not taking the OCP will be asked to complete **four visits** over a 28 day period. Female participants who are taking the OCP will be asked to complete an additional two visits (**six visits** in total).

**Visit 1**: for body composition, height/weight measurements and completion of a demographic, health and lifestyle questionnaire at Auckland City Hospital (takes approx. 45mins)

**Visit 2, 3, 4 (and visits 5 & 6 for women taking the oral contraceptive pill)**: Participants will arrive at the Human Nutrition Unit in the morning after fasting for 12 hours. Blood samples will be collected and measurements of body temperature, metabolic rate, blood pressure, heart rate, appetite and fullness will be taken. The participant will then be given a breakfast meal containing either a low, normal or high level of protein. Measurements will then continue for an approximately 4.5 hours. After the protein test, participants will be provided with a lunch meal and some post-meal measurements will also be taken (each visit takes approx. 6hrs).

## 5. What happens if you decide to take part?

**Visit 1 (45 minutes)**: You be asked to come to Auckland City hospital for a screening visit, we will explain the study to you and you will have a chance to ask us any questions you may have. If you would like to participate, we will then ask you to sign a consent form that says that you agree to do the study. By signing the consent form, you will be giving permission for the researchers to enrol you into the study and conduct the various measures described below. We will gather some additional demographic, diet and lifestyle information and measure your height and weight. We will then ask you to undergo a body composition scan (DXA scan), which takes about 15 minutes. For more details about the DXA scan please see section 7.

We will then schedule you to attend the HNU in Mt. Eden for the remainder of your Visits, and arrange the delivery of evening meals for you to eat between 7.30 and 8pm on the nights before your visits. These meals contain a certain amount of energy and this helps with the accuracy of the assessments at these visits.

**Visit 2, 3 & 4, plus visit 5 & 6 for women taking the OCP (6 hours each)**: For all visits you will be asked arrive at the HNU in Mt. Eden at 7.45 am following an overnight fast (nothing to eat or drink, water only) and remain at the facility for approximately 6 hours. We ask that you please travel to the HNU by car/bus/train as we don't want you to do more than minimal physical activity the morning of the visit. In addition, we ask you to abstain from intense exercise, alcohol and excessive caffeine for 24hrs before each visit.

Upon arrival, you will be given a glass of water and we will record your body weight. Following this, our Research Nurse will insert a cannula (small plastic tube) into your arm. This is to facilitate blood collection throughout the study session so that you will feel the needle prick just once. Cannulas are often used in hospitals, and once inserted

do not usually cause any discomfort. You will be supervised/monitored by Research Staff over the 6 hour study period. Following this, we will collect a blood sample and take your blood pressure and body temperature. We will also get you to complete a short questionnaire about your current appetite, which we will get you to repeat often during the study visit.

We will then ask you to sit in a comfortable chair to which a canopy is attached (like in the image overleaf). We measure your metabolic rate from the expired air that is collected through this canopy system. You will remain seated in this chair from about 8.30am until 1pm. You can watch a calm movie or documentary during this time. At 9am we will ask you to eat a breakfast meal of toast, butter and jam, plus either a dairy or non-dairy based drink. A small portion of the drink will contain soluble paracetamol. We will continue to take measurements (blood, blood pressure and appetite questionnaire) multiple times until 1.05pm. It is important that you are relaxed throughout the experiment, so please tell the researcher if you are uncomfortable or if there is something you need. During all of the measurements it is important that you avoid large movements, but if you need to readjust your position, use the bathroom, or you need to itch or scratch in order to be more comfortable, of course you may do so.

At 1.10pm, we will serve a lunch meal in the dining room and you will be asked to eat as much as you like until you are comfortably full. After lunch we will do final blood pressure, body temperature and appetite measurements. At 1.45pm you will be finished the visit and can leave the HNU.

## 6. What will my blood samples be collected for?

At each Visit 2 – 4 (or Visit 2 – 6 for women taking the OCP) we will collect approximately 79ml of blood so that we can test for known biomarkers of cardio-metabolic disease risk including glucose and lipids. We will store the blood samples for up to 4 years. Samples

will only be stored in NZ and used for the purpose of this research. Any leftover samples will be destroyed by incineration according to University policy.

Once your blood has been collected, it is sent for storage and then analysed as a group with all other participants. Any remaining samples will be destroyed at the end of the study. You may hold beliefs about a sacred and shared value of all or any tissue samples removed. The cultural issues associated with sending your samples overseas and/or storing your tissue should be discussed with your family/whanau as appropriate. There are a range of views held by Māori around these issues; some iwi disagree with storage of samples citing whakapapa and advise their people to consult before participating in research where this occurs. However, it is acknowledged that individuals have their right to choose. If you are Māori and would like to request a specific tikanga (Māori custom) process, please feel free to talk with the research team.

## 7. What is Dual energy X-ray Absorptiometry (DXA)?

DXA is a scanning method, to measure body composition (bone, fat, muscle). The scan process takes about 15 minutes and is not unpleasant. We will ask you to wear gym-style clothing and to remove any metal from your person for the scan. You will need to lie quietly, without moving, on an open bed and a scanning arm passes quickly over the top of you. As the scanning arm passes over you it emits 2 types of very low dose X-ray, similar to the radiation dose that you would receive if you took a 1 hour flight – e.g. between Auckland and Wellington. The DXA then measures the density of the different tissues in your body. Bone is very dense so it appears bright white on the scan. Muscle is less dense and so it is less white, and fat even less dense and so it is the least white of all. At the end of the scan we will print a picture of you showing an image of the bone, fat and lean tissue in your body for you to take home with you.

## 8. The benefits and risks of the research

There will be no benefits from participating in this project other than obtaining some information pertaining to your health.

There is very low risk associated with taking part in this research study.

Although uncommon, some individuals may experience discomfort during cannulation. Research staff will monitor you during the treatments. The research will be stopped should any harmful effects appear or if research staff feel that it is not in your best interest to continue. You should promptly inform the research staff if you feel uncomfortable or unwell at any stage.

The dose of X-ray involved in the DXA scan is similar to the radiation exposure on a flight from Auckland to Wellington.

## 9. Results from the study

You will receive your Body Mass Index (BMI) and DXA scan results at your Visit 1. A whole body DXA scan costs about $100 to have done privately and gives you detailed information about your body composition (e.g. how much muscle and fat you have). The type of DXA scan that we do does not accurately measure bone density. At the end of the study you will also receive results from your blood tests such as your blood glucose, insulin, and lipid profile. It may take a while before you receive these blood results we will need to wait until all participants have completed their visits to analyse all the bloods collected together. If there are any results from either the DXA scan or the blood tests that are outside the reference ranges we will discuss this with you, and also inform your G.P. if you have consented for us to do so.

## 10. ACC Compensation for injury

If you were injured in this study, which is unlikely, you would be eligible to apply for compensation from ACC just as you would be if you were injured in an accident at work or at home. This does not mean that your claim will automatically be accepted. You will have to lodge a claim with ACC, which may take some time to assess. If your claim is accepted, you will receive funding to assist in your recovery.

## 11. Confidentiality

On enrolment into the study, you will be allocated a unique study ID number and this will be used to label your samples, data collected and results. This protects the confidentiality of your identity during and after your participation in the study. Research files and all other information that you provide will remain strictly confidential. No material that could personally identify you will be used in any reports on this research. Upon completion of the research, your records will be stored for 10 years at HNU, after the study ends and be accessible only to members of HNU research team. All computer records will be password protected.

## 12. Study Compensation

Men and women <u>not</u> taking the OCP will receive compensation for their time and travel of **$170 in supermarket vouchers in total**; $20 voucher after the completion of Visit 1 and a $150 voucher after the completion of Visit 4.
Women who taking the OCP will receive compensation for your time and travel of **$270 in supermarket vouchers in total**; $20 voucher after the completion of Visit 1, $150 voucher after the completion of Visit 4, and a further $100 voucher after Visit 5 & 6.

## 13. In Addition

Thank you for considering taking part in this study. This research has received Ethical Approval from the Southern Health and Disability Committee (Ethics reference: *19/STH/30)*

If you have any queries/concerns, please contact the PhD student for the study:

**Julia Cree (contact for general queries)**
PhD Student
Human Nutrition Unit
University of Auckland, New Zealand
Mobile: 022 0647227
Email: j.cree@auckland.ac.nz

## 14. Investigators of the research

**Dr Jennifer Miles-Chan**
Senior Lecturer & Sir Charles Hercus Health Research Fellow
Human Nutrition Unit and School of Biological Sciences
University of Auckland, Auckland, New Zealand
Telephone: 09 923 4322
Email: j.miles-chan@auckland.ac.nz

**Julia Cree (Contact for Participants)**
PhD Student & Study Co-ordinator
Human Nutrition Unit
University of Auckland, New Zealand
Mobile: 022 0647227
Email: j.cree@auckland.ac.nz

**Niamh Brennan**
Research Assistant
Human Nutrition Unit
University of Auckland, New Zealand
Telephone: 09 6301162 Mobile: 022 3234775
Email: n.brennan@auckland.ac.nz

***Please keep this information sheet for your records.***

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

**School of Biological Sciences**

**Human Nutrition Unit**
The University of Auckland
18 Carrick Place, Mt Eden
Auckland, 1024.
Phone: +64 9 630 1162

# The influence of gender and the oral contraceptive pill on protein induced thermogenesis

## CONSENT FORM

I have read and I understand the Patient Information Sheet and wish to take part in this research study.

I have had the opportunity to discuss this research with the investigator. I am satisfied with the answers I have been given.

1. I have had the opportunity to use support from a family (whanau) member or a support person to help me ask questions and understand the research.
2. I understand that taking part in this research is voluntary (my choice), and that I may withdraw from the research at any time and this will in no way affect my future or continuing health care.
3. I understand that my participation in this research is confidential and that no material that could identify me will be used in any reports on this research. I understand that the sponsor of the research, others working on the sponsor's behalf, the Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current research and any further research that may be conducted in relation to it, even if I withdraw from the trial. I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published.
4. I understand that the investigation will be stopped if it should appear harmful to myself.
5. I understand the compensation provisions for this research.
6. I have had time to consider whether to take part.
7. I know whom to contact if I have any questions about the research.
8. I agree not to restrict the use of any data or results that arise from this research provided such a use is only for scientific purposes.

| ***Participant to complete:*** *Please circle as appropriate* | | | Participant Signature: |
|---|---|---|---|
| I consent to participate in this research study | Yes | No | |
| I consent to my GP or current primary health care provider being informed about my participation in the study and of any significant abnormal results obtained during the study. | Yes | No | |

| | | | |
|---|---|---|---|
| If I decide to withdraw from the study, I agree that the information and blood samples collected about me up to the point when I withdraw may continue to be processed. | Yes | No | |
| I wish to receive a copy of the results, when published. | Yes | No | |
| I consent for research staff at HNU to contact me later if there are future studies for which I am eligible. | Yes | No | |

## INFORMED CONSENT FORM

***Participant to complete:***

I _____ Print full name
Of _____ Print address
_____
_____ hereby consent to take part in this study

_____ Signature of Participant
_____ Date

***Research Personnel to complete:***

_____ Project explained by
(on behalf of the Principal Investigator)
_____ Signature
_____ Project Role
_____ Date

***A copy of this consent form is to be given to the participant and a copy to be kept in their research file by the Investigator.***