Acknowledgements

This thesis has a long history, and would not have existed without the help of many people. It all started some time at the end of 1994 with an application for a job at the International Atomic Energy Agency in Vienna. It was the last day before the closure date and I was very much in doubt whether I should apply or not. I had always wanted to work abroad, but to my taste Vienna was not exotic enough. Another reason for my doubts was that I was not familiar with the use of stable isotopes, a prerequisite for the job. I had done some work with tritium in immunological research in carp, but $^{13}\text{C}$, $^2\text{H}$, and $^{18}\text{O}$ were unknown to me, and so was a human application of isotopes. But late at night I filled out the application form, posted it the next day, and on my birthday I got the news that the job was mine. Carla Fjeld was my first supervisor at the IAEA, and she introduced me into the field of stable isotopes as a tool for the evaluation of nutrition interventions. Her successor was Andy Coward, and after he spoke the very important words “you can’t keep on travelling around the world pretending you are an expert”, I realised that if I were to continue to work in the area of international nutrition, and get some sort of recognition, I needed to get a PhD. As part of the associate professional officer programme of the Ministry of Foreign Affairs, through which I was appointed at the IAEA, I was given the opportunity to go to a developing country for 2 years. Cesar Victora, who had been involved in an IAEA project related to the WHO Multicenter Growth Reference Study, welcomed me to work in his group at the Federal University in Pelotas, Rio Grande do Sul, Brazil. The first study (described in Annex I and II) had already been designed and planned, but for the implementation it was decided to wait until our first child, Lars was born. The work included lactation counselling which was coordinated by Elaine Albernaz, and although I had never thought I would breast-feed for more than 4 months, Elaine’s counselling made me go on a little longer, and in the end Lars was breast-fed for a whole year. A funny mixture of science and personal experience.

For a PhD however, I needed to do another study. Cesar was very supportive, and showed me what a good study design requires. Several draft proposals and calculations of statistical power went through his office before we came to a final proposal that was both scientifically interesting, and methodologically sound. Cesar would then still say it included too much lateral thinking, but that was the compromise that had to be made. After the proposal had been designed the long battle in search of funding was started. Roel Vonk and Henk Visser guided me through the lengthy procedure of the funding process, and helped me to focus my thoughts to eventually come to a well-written study proposal. Just a few days after Thorben was born, I received a request for more information from the funding organisation. My brain was not collaborating at all, and only with Cesar dictating the answers did I manage to type them into the computer, and send them off. Unfortunately, the grant was not given to us, and we had the option to...
either go back to the Netherlands (without a PhD) or think of a plan B. It was incredible and heart-warming to see how teamwork can make the impossible happen. Within a couple of days I was promised isotopes from Henk Visser, money for field work, and isotope analysis of all samples from Andy, and a salary from Cesar. Needless to say that this work would not have existed without their support. When that was settled I forgot about work for a while and enjoyed my maternity leave and being with Lars and Thorben, while also thinking about a decent study design. When it was decided that respiratory calorimetry was going to be essential for the interpretation of total energy expenditure work, the next challenge appeared. Jonathan Wells offered to send his Deltatrac machine from the UK, but Cesar warned me for unpredictable and costly custom procedures. With the perseverance and many working hours of both Jonathan and myself, and thanks to Luis Fernando Barros’ diplomatic skills, and Remko’s presence on the customs’ doorsteps in Porto Alegre this battle was also won…… Three days after Jonathan had arrived, and two days before he left, the Deltatrac arrived. Just in time to get the training needed to be able to do the measurements.

Since that time everything went very well. Thorben served as a guinea pig for all components of the study, as he was exactly the same age as the babies in the study when it all started. He was the first baby I dosed with $^{18}$O, the Deltatrac was tested on him (he would stand up in his bed every time the hood was put on him), his motor development was tested using Bayley’s Scales, and his food was weighed. I had been concerned about the acceptance of the sleeping metabolic rate measurements by the mothers (since I myself would have been), but although mothers would complain about the collaboration it required, refusal rates were very low. Danton Duro Filho was irreplaceable for this job. His “batidinhos na bundinha” (slaps on the bottom) to make the baby sleep again became famous, and the mothers loved it. Without his persistence and care we would not have had the results we now have. Mara Santos was my right hand in the coordination and administration of the field work, and during the period of the field work, every Tuesday we went out to the field together in my car, a Chevrolet Monza, that after we left Brazil, and sold it, turned out to have worked only on two cylinders, with sand all over the engine even inside the carburettor. But although it produced loud bangs occasionally, it never let us down……

The dosing of doubly labelled water was another highly responsible task and Verina was the perfect person to do this. She, unfortunately, had a stroke some time after we moved to the Netherlands, but I hope that if I were to do another study in Pelotas, she could be involved again. Other field workers were Marcia Carvalho (screening of the subjects), Clarita Pereira Alves and Miriam Hellwig Franz (collection of saliva and urine), Josiane Katrein, Ana Beatriz Palmeira, Ana Lucia Isquierdo (anthropometry), Luciana Maroñas Monks, and Adriana Kaster
(food-weighing), Rita Silveira (quality control), and Patricia Vianna (psychologist), and I am grateful for their dedication to the work, which has been invaluable for the quality of data collected. I would like to thank Wilian Trinidad for his help with the data entry, and in case of any computer calamities, and Angélica Rodrigues for secretarial help. In the middle of all these work-related activities Remko was the one who would point out to me that the grass was still growing when my eyes were getting square from working too much behind the computer, and he would always be happy to have a “churrasco” with the team of field workers at our home.

In May 2002 we returned to the Netherlands, and since then I have been part-time working on the thesis. Adaptation to a “siesta free” environment, where a woman is expected to be the chief cook and the bottle washer, and have more than 24 hours a day at her disposal, has been very difficult, and I have often wondered how Dutch women manage to do all these things. Certainly, without the help of my parents, I would not have managed. They have always given me the freedom to find out by trial and error in which direction my life should go, but they would be there when I needed them.

Most of the writing was done at the Zoological Laboratory in Haren, and I thank Henk for making a desk available in his office, and allowing me to partially occupy his workspace, for always being patient and ready to explain energetics, and look into the raw data, discuss results and conclusions, even outside working hours. I thank Aukje Adams for secretarial help, and Dick Visser for preparing the figures and the cover for the thesis.

Roel’s contribution has been very important especially in the writing up of the synthesis and summary. He showed to me what scientific writing amounts to and it was both fascinating and frustrating to see how something that I had written could still be improved to make it more comprehensive to the reader.

My regular visits to Cambridge were invaluable. With Jonathan I would discuss results and implications (and Brazilian music) and he would draw my attention to the latest literature relevant to the work. I would like to thank Antony for doing the isotope analysis, and for supplying me with anything I would need in the field. Andy’s support has been fantastic throughout. One word from him would make me understand that there was another task waiting for me to tackle. His contribution to this thesis has been much more than that of a supervisor, and if there is such a thing as a scientific father, then Andy is mine. He stimulated me to do a PhD, provided the tools that I needed, made his lab and personnel available to work on my data, he nominated me for a Rank Prize Symposium (that I won), and helped me to bring the writing part to a satisfactory end. Thank you Andy, for having this faith in me. I would also like to thank Francisca Santamaria, for her hospitality whenever I was in Cambridge. Thanks to her care and cooking, my body weight was built up again to an acceptable level each time when I was in Cambridge.
I look forward to the day of the viva (or was it the day after?). I hope that all people attending will enjoy it, and Joke and Carin, I thank you for being my paranymphs during that day.

My last words will be for Lars and Thorben: Lars, thank you too for helping me to finish this thesis. It was a great idea to bundle a bunch of papers and make it grow faster. It’s time now to make that pirate costume for you and Thorben.
The human face of field studies

What is easily forgotten in epidemiological research is that there are individuals behind the data. Especially, when data collection involves field work in a limited number of subjects, the interaction between researcher and participant are of great value, and often determine success or failure of a measurement. As this study included a comparison of socio-economic classes, including the poorest people in Pelotas, this contact was sometimes warm and moving, other times shocking or frustrating, and at times even risky. I am very grateful to all the mothers who participated in the work described in this thesis. The harsh conditions under which part of them were living was hardly ever reflected in the way we were accepted at their homes; they would welcome us with a smile on their face and do whatever they could to make us do our work as good as possible. The following is a contribution from two field workers to illustrate the conditions under which the data were collected.

Note from the nutritionist – Josiane Katrein

It was on the 5 December 2001, Rua Uruguaí, mother named Cátia and the child Nicolas. I arrived at about 9 o’clock, it was constantly raining, and the place started to get flooded. I was received very well by the mother; she showed much interest to participate in the study. Apart from Nicolas, Cátia had five other
children, and they were all at home during the day of food-weighing, highly agitated. At some moment Cátia left without telling me (she went to a medical post), and the children started to fight, shout, make a mess, and I did not know what to do. Then I smelt something was burning, which happened to be Nicolas’ food that I was supposed to weigh. So, I turned off the stove, and helped the eldest of the girls (12 years of age) in the kitchen. Soon after that the grandmother arrived to take care of them, and they calmed down, but until that time it was a hassle.

Notes from the field worker doing the sleeping metabolic rate measurements – Danton Duro Filho

The interaction between a field worker and the participating mother is not part of a measurement, yet the circumstances under which the measurements are made and the field worker’s reaction to them determine whether the measurement is going to fail or succeed. To my opinion, the gaúchos are very special people. We are cheerful, funny, irreverent, and at the same time we are so deprived, with large social inequities, so much suffering. How can we live with those inequalities? With the following two stories I hope to explain some of this question.

Márcio is the first name to be cited. He is Keise’s brother, a child whom I measured. I was just doing my job in that house in a poor area of our city (Dunas); it was the second visit and I had already adapted to the place, a one-room house, very poor, and to its people, this little boy in particular. He is very smart, and different from most other children who live in places like his. He does not live in the street, and gets special attention from his parents. He is well behaved, and very funny, and tries to be considerate as much as is possible for his 5 years of age. During that visit which was close to Christmas, he gave me a little note. It said: “Father Christmas, I would like to get a mobile phone”. Father Christmas could be found in the central park of the city, and as his father could not take the note there I was chosen as the messenger of his card. I decided that his present was going to be given by me and when I talked about this with another family participating in the study (one of high socio-economic class), we decided to make this family’s Christmas and New Year into something special. On Christmas day I brought them presents, and when the little boy pressed his present still wrapped in paper, and it started ringing, he felt his dream had been realised, so he ran out to the streets, shouting that he had gotten the present he had wished for Christmas. On New Year’s Day, the “rich” family brought cake, champagne, and presents. At times, solidarity can be joined and expressed in various ways.

The second name is Alex. I had visited his house several times, but had not managed to do a successful measurement, until this time, very surprisingly.
The child would not sleep, but as it was very difficult to find them at home, I insisted. I waited for almost two hours, but still the child would not sleep. When I was getting very desperate, the mother said: Wait till the father gets home, and I am sure he will sleep. I wondered what magic formula he was going to use to make this very agitated child sleep. When he arrived he showed me the sleeping formula! His profession was DJ, and from what I saw the child will follow in his footsteps. When he arrived his wife asked him to make the child sleep, and so he put his sound system at a very high volume, and chose the music that would sing his son to sleep. “É na manteiga, manteiga, manteiga....” (It’s in the butter, butter, butter...). As if a magical trick, Alex closed his eyes and slept deeply. I did not understand, and was astonished when the father told me that he could not switch off and even less change the music as the child would wake up. After one hour of listening to this one song, I was feeling dizzy, deaf, and with a severe head-ache (but with an excellent measurement). To take the final proof, at the end I asked him to reduce the volume. Alex started to mutter, and woke up. I took the indirect calorimeter to the car, and ran out of this house. What a madness.