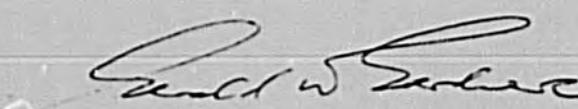


September 5, 1984

TO: Avanelle Kirksey
FROM: Gerald W. Gardner 
RE: Trip Report - Cairo, August 8-22, 1984.

The purpose of my trip to Egypt was to carry out the following:

1. To set up the Beckman MMC at the Institute of Nutrition and to check it thoroughly.
2. To train as many persons as possible on the use of the MMC - calibration, data collection, and RMR procedures.
3. To set up the MMC at Kalama and supervise the RMR data collection and to institute appropriate quality control measures.

Fortunately my arrival in Cairo was preceded by the clearance of the calibrating gases through the Cairo Customs, so there was no delay in beginning the check out/calibration procedures at the Institute of Nutrition.

Dr. Gail Harrison met me Saturday morning and drove me to the Institute where I met with Drs. Osman Galal, Farouk Shaheen, Farouk El-Wahab, Abdul El-Naggar and Morsy Hasasein. We discussed the fastest way to proceed, and it was agreed that I would work with the MMC at the Institute during the check out phase and then move the instruments to Kalama for actual data collection as soon as possible. Dr. Morsy was assigned to me for training in the operations of the MMC and some of Dr. Shaheen's "young physicians" were to be assigned once the instrument was set up in the field.

The instrument was located in a ground floor room with adequate ventilation although it was also obvious that little care had been taken to keep the machine "dust free." The first order of business was therefore to clean it thoroughly.

As per my memo to Drs. Galal and Shaheen, which I submitted on my departure (copy enclosed), the oxygen analyzer was found to have a small malfunction. Whatever the problem is, it was beyond my knowledge and ability to repair. (It was unfortunate that the local Cairo Beckman representative whom I understand has been trained on the servicing of the MMC was not available during the time I was in Cairo. The local reps. that were present on two occasions knew far less about the machine than I did, which meant all my trouble shooting had to be carried out via telephone with Beckman Geneva.)

TO: Avanelle Kirksey
September 5, 1984

Having established the calibration procedures and trained Dr. Morsy in this aspect of the MMC operation I decided to move the equipment to the field, and arrangements were made to do this on Thursday August 16, thanks to Dr. Norge Jerome who had arrived just before Gail left for the U.S.A. The move was accomplished without too much difficulty and the facility at Kalama appears more than adequate for the RMR data collection. Because the truck had to return immediately to Cairo no check out of the instrument was carried out that day.

The next day was extremely frustrating, for upon our arrival at Kalama we were told that the room would not be unlocked for us due to some "administrative difference" between the Kalama Health Center and the Institute of Nutrition (These "differences" Shaheen assures me are now "taken care of.")

Saturday it looked like we were going to waste a further day when we were again told the key was not available. However, thanks to Dr. Morsy's persistence we were finally let in and managed two hours working on the MMC. What became immediately evident as we set up the instrument and followed through the calibration checks was that the local power supply was inadequate for the MMC to function correctly. The same problem first manifested itself in Kenya where a new 2.5 KW generator was the solution. We returned to Cairo to locate a voltameter (none available) and discuss the alternatives with Dr. Shaheen. (Dr. Galal was out of the country.) Monday we tried again, hoping the early morning power supply might be stronger, but with the same problems of the calculator not accepting the Nutrition Assessment Program.

The time at Kalama, however, was never completely wasted, for Dr. Morsy got to carry out the daily calibration procedures and even without the calculator we conducted mock runs with subjects so that he also got to learn the data collection procedures.

Dr. Morsy is a dentist by profession so he has excellent experience working with apprehensive subjects, and also has a strong scientific concern for accuracy and reliability. Tuesday was my last day in the field so Nancy Meyer accompanied us so she could acquaint herself with the MMC operation and RMR procedures. That day there was no electricity in Kalama so we merely worked through the procedures while one of the drivers and someone from the Institute tried to locate and re-suscitate the ONAN generator which was somewhere in the Health Center. This was actually accomplished, although no gas tank in present and there is presently no way to get the power from the generator to the MMC voltage regulator box.

As you may perceive, I returned to the U.S. Wednesday somewhat frustrated but confident that the problems in Egypt were certainly not unsurmountable.

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To: Drs. Osman Galal & Farouk Shaheen

From: Dr. Gerald Gardner

Date: August 24, 1984

RE: MMC and RMR Measures

The initial problem I discovered with the MMC upon arrival was that the oxygen analyzer (OM-11) was not functioning correctly, i.e. values for known gas concentrations — ambient (20.9%) and the calibrating gas (15.6%) were not possible at the same time which indicates a malfunction within the analyzer itself if pressure differences, leaks, etc. can be accounted for. The CO₂ analyzer appeared to function perfectly, as did all other aspects of the MMC system.

In an attempt to discover the cause of the OM-11 problems I systematically checked all line connections, cleaned all solenoids in the drawer, and checked for all leaks and restrictions to flow. The oxygen sensor, within the oxygen head assembly, was replaced on two occasions (once from stock initially provided by Beckman and once from stock provided by the local Beckman/Cairo representative).

NOTE: The "shelf life" for these sensors is 6-12 months and their life in the MMC depends upon the time it is used and the concentrations of oxygen it is "seeing". They should last approximately 100 hours of analysis as we are doing provided the pumps are turned off between subjects. The capillary tubes within the oxygen head were also checked.

On advice from Sensor-Medics/Geneva several other procedures and checks were made but without success.

THE OXYGEN ANALYZER IS NOT FUNCTIONING AS IT SHOULD.

RECOMMENDATION - Someone from Sensor Medics/Geneva or Beckman/Cairo who understands the operation of the OM-11 should check the instrument out thoroughly.

While calibrating the MMC some other problems also became evident.

1. A barometer reading mm Hg needs to be available for occasional recalibration. This is not a priority item as local readings of pressure may be obtained from the airport, and in this part of Egypt the differences should not be a factor.
2. Ambient temperature is a problem. A large fan should be purchased to keep the MMC cool during its operation. The recommended temperature range for the instrument (internal reading), is 20-32°C and when it exceeds 34° we have seen it reject data.

- 3. Dust and dirt are always problems with sophisticated instrumentation like the MMC. Some type of cover, such as a sheet or tablecloth, should be purchased to protect the instrument when not in use.

On moving the MMC to Kalama a major problem immediately became evident. THE MMC REQUIRES A CONSTANT 220V CURRENT. Wall outlets at Kalama showed 170V most of the time, with the current rarely going above 190V. Which is entirely unacceptable by the MMC. - The Nutritional Assessment Program which must be loaded into the computer each day will not be accepted by the instrument unless the current is above 210V. The generator, which I understand has been purchased but is nonfunctional at this time, must be activated immediately as the primary power supply. Some form of booster transformer should also be purchased if not available at the Institute presently.

During my short stay I have had the opportunity to work closely with Dr. Morsy Hassanein and am confident that he can set up the MMC, calibrate the instrument, and make the RMR measurements providing the above details are attended to by CRSP/Cairo. Attached are the protocols, data sheet and helpful hints for persons working with the MMC and taking the RMR measurements. These have been worked out with Dr. Morsy and before I leave I hope to have also helped in the training of some others (young physicians) who will be assisting Dr. Morsy, as a staff of at least two, with one a woman, is minimum for this operation.

Purchase of face masks rather than the present mouthpiece/respiratory valve arrangement is also recommended. Subjects will be much more comfortable and less apprehensive with a mask. I have discussed this with Nell Kirksey and will follow this up when I return to the US. A regular supply of calibrating gases is also necessary and UCLA knows of a shipping agent, who specializes in handling compressed gases. Dr. Kirksey has also been informed of this as has Dr. Gail Harrison.

Consumable supplies such as alcohol and other sterilizing solutions must also be purchased as well as chem wipes, cotton, etc.

The data form as presently formed should probably be altered so that both the RMR measures - Kcal/day and Kcal/kg/day are recorded for each of the three minute collection periods. The main computer can then produce the means which at present were to be calculated independent of the data sheet. Such an arrangement as at present does not allow the raw data to be viewed, and leaves a good chance for error.