

Japan: Food and Evacuation, by Wade Allison 7 Aug 2011

How much radioactive meat is safe to eat in Japan?  
No ill effect would result even from 2000 kg eaten in 4 months.

That is an extraordinary statement -- nobody could eat that much anyway.

To find the reason for this statement read further below.....

and also the [book](#) by [Wade Allison](#), Oxford University,

published in [English](#) (paperback, kindle and e-reader editions) and now in [Japanese](#)

Where do current safety regulations for ionising radiation come from? Are they sensible and are they in everybody's best interest?

In the 20th century most people learnt to think of ionising radiation as a quite exceptional source of danger to human health. They were two reasons for this. Firstly, during the Cold War there was very real concern about nuclear weapons. In addition to fear of their immediate explosive blast, fire and radiation impact, concern about radioactive fallout and radiation after-effects became rooted in opinion worldwide. Secondly, ionising radiation cannot be consciously felt, leaving people "in the dark" and easily worried. (Instruments to monitor the presence of significant radiation are still not widely available although the basic technology is similar to a simple domestic smoke alarm.)

These concerns could not be answered in earlier decades because there was no adequate understanding of the biological effects of ionising radiation, and the various cellular repair and adaption processes were unknown. Also, there was inadequate human data with which to show whether fears were justified or not. An aversion to radiation meant that few people took more than a superficial interest in radiation science. The exception was in medicine where beneficial high radiation doses have been used for more than a century to cure cancer. The implanted radioactive sources and beams used are similar, sometimes identical, to those that cause consternation in the environment. It is public experience that this use of radiation in medicine when used carefully is good and so safe. Most people have a friend or relative who has benefited. Benefits are just as obvious with medical scans that use radiation, CT, SPECT and PET, where the radiation doses are a thousand times lower than for radiotherapy. So these are safe too.

From the early days the ever-possible unseen threat of nuclear radiation caused strong public reaction, particularly in first world democracies where annual marches and political movements expanded. Politicians, faced with a clamour for protection against radiation and anything called "nuclear", readily endorsed regulations based on levels As Low As Reasonably Achievable (ALARA). The ICRP (the International Commission on Radiological Protection) reasonably drew up advice for all nations on this basis, although that was always a matter of acceptability rather than danger.

In the 21st century much has changed. For a start, after 50 years of laboratory work, the radiation biology of cells is now fairly well understood. This shows that life exhibits an extraordinary resilience to damage by radiation -- and this agrees with many large scale studies of the effect of radiation on humans (as well as animals) that are now available. Also, in spite of popular and media expectations to the contrary, the effect of all serious civil nuclear accidents has involved a very low loss of life, even though in each case the nuclear reactors themselves have been destroyed. Specifically, there was no loss of life at Sellafield (1957) or Three Mile Island (1979). At Chernobyl there were about 50 deaths as confirmed by the UN report of 28 February 2011. Further, it is very unlikely that there will be any loss of life at Fukushima due to radiation, even from additional cancer in the next 50 years [based on recorded doses to workers at Fukushima and cancer rates measured for survivors of Hiroshima and Nagasaki with similar doses].

Yet the effect of current ALARA-based ICRP recommendations have resulted in unreasonable consequences, sometimes with considerable suffering for the local population, at Fukushima as at Chernobyl. Public concern that the authorities have under-reacted and have something to hide, has caused further over-reaction with further damage to health and public trust. Evacuation and the safety of beef are two instances.

# PET/CT がんどック

**PET/CT検査とは、**  
「がん細胞が正常な細胞に比べて多くのブドウ糖を取り込む」という性質に着目した検査です。  
この検査では、一度の撮影でほぼ全身をみることができ、PET単独検査に比べて診断精度が格段に向上した「がん画像診断法」です。



## 料金

94,500円

※出雲市では、2万円を補助する制度があります。  
対象者：40歳以上の出雲市民  
実施期間：平成23年4月1日～24年3月31日  
詳細は健康増進課までお問い合わせください。

## 実施日

毎週月曜日～金曜日

(但し祝日・年末年始は除く)

## 診療の流れ

### 絶食

検査の6時間以上前から絶食にしてください。ただし、糖分を含まない飲み物（お茶、お水）は飲んでもかまいません。

### FDGの注射

FDGを注射します。

### 安静

薬剤が全身にいきわたるまで、約1時間安静にします。

### 撮影

排尿後、PET/CTカメラの下で約30分安静にし、撮影します。

### 診断

専門の医師がPET/CT画像を撮影し、総合的に診断します。

## PET/CT検査に関するQ&A

**Q** 糖尿病でも、検査を受けられますか？

**A** 糖尿病など血糖値が高い方の場合、FDGが筋肉や脂肪へ集積しやすい傾向にあるため、がんへのFDGの集積が低下します。そのため診断精度が下がる場合があります。PET/CT検査が実施できるかどうかについては、かかりつけの医師にご相談ください。

**Q** 妊娠中や妊娠の可能性のある場合は検査を受けられないのですか？

**A** FDGは、微量の放射性物質を含んでいますので、妊娠中や、妊娠の可能性のある方は必ずかかりつけの医師にご相談ください。

**Q** PET/CT検査なら、どんな種類のがんも見つけられるのでしょうか？

**A** 臓器や部位によっては、発見しにくいがんがあることもご了承ください。FDGは尿中へ排泄されるため、腎臓や膀胱などのがんも発見しにくい場合があります。

### 発見しにくいがん

胆膵・尿管の癌  
腎臓癌  
肝臓癌  
腎癌  
前立腺癌  
(すべての臓器の)微小ながんなど

**Q** PET/CT検査は入院が必要なのでしょうか？

**A** FDGを注射してから撮影終了まで、5時間程度ですので、入院の必要はありません。

## A recent advertisement for part-subsidised PET/CT screening scan

On 27 July 2011 the Japanese government issued instructions “[Measures against Beef](#)”, about meat that exceeds their radioactivity limit of 500 becquerel per kg. But

at the same time public subsidy is offered to encourage the public to have a PET/CT scan in a clinic, as shown in the above advertisement. This screening scan gives a whole-body dose of 15 milli-sievert and is safe, but gives the same dose as the consumption of 2000 kg of radioactive beef in four months. [On page 12 of the Measures it says that eating 1 kg of beef containing 500 becquerel per kg of caesium-137 gives a whole-body dose of 0.008 milli-sievert, and this has been checked. Dividing 15 mSv by 0.008 mSv per kg shows that the scan is equivalent to 2000 kg, that is 2 tonnes of beef per person.] A similar argument can be applied for iodine. In medical imaging studies to determine the health of the thyroid the patient is injected with a dose of 3-7 million becquerel of radioactive iodine, the equivalent of eating 1.5 to 3 tonnes of spinach at the limit of 2000 becquerel per kg, although the iodine-123 used nowadays is considerably less harmful than iodine-131. Anyway, all such iodine has gone away having decayed in the weeks following the accident.

Condemning food at this level is unreasonable. The economic and personal hardship caused should not be accepted. At the time of Chernobyl the Swedish Radiation Protection Authority set the intervention level at 300 becquerel per kg and raised it a year later to 1500 becquerel per kg. In 2002 they admitted in the Swedish daily newspaper, Dagens Nyheter 24 April, that they had destroyed 78% of all reindeer meat unnecessarily, at great loss and causing much hardship. This error is now being repeated at Fukushima.

At Fukushima the guide-line for evacuation was set at a radiation level of 20 milli-sievert per year. But any patient on a course of radiotherapy to cure cancer gets a dose to the tumour of 2000 milli-sievert each day for 5 or 6 weeks; the dose to tissue and organs within 10-15 cms of the tumour is 1000 milli-sievert each day. Usually the body recovers from this high peripheral dose which is in excess of 20000 millisievert, total in a month, and the patient thanks his radiologist and goes home to enjoy more years of life. This is the same dose in one month as would be received in 1000 years at the edge of the Fukushima evacuation zone. The trauma of evacuation has a very serious effect on life, making for real hardship and personal misery, especially among the old and very young. The gross error of major evacuation-- a form of socio-economic surgery -- was acknowledged in the case of Chernobyl by the IAEA report of 2006 and the UN report of 28 February 2011. When it came to Fukushima just a few days later, this lesson had not been learnt. Of course, in the initial few days when it was still uncertain whether all nuclear fission had ceased and cooling of the reactors was not being provided, emergency evacuation was appropriate. Those days are now long gone and the people should be encouraged to return home.

In practical clinical terms the hardship of evacuation and the apparent threat of unseen radiation does itself generate ill health. Real illness may be psychologically induced through the nocebo effect, the malign counterpart of the beneficial placebo effect. It takes experienced doctors and health workers to separate the effects of fear from those of radiation.

To survive on Earth mankind needs to understand dangers rather than running away from them like an animal driven by unthinking fear. Education and trust in the action of authorities is essential. Then the dangers need to be compared and decisions taken. In particular, in the case of ionising radiation levels As High As Relatively Safe (AHARS) should be allowed, where the meaning of “relatively” depends on the competing dangers, such as evacuation, having no electric power, shelter, food and water. It is time that radiation safety levels were changed to take the same care of society and the environment that is used in decisions made for individual personal health in consultation with doctors. In a world of other dangers -- earthquakes, global warming, economic collapse, shortages of jobs, power, food and water -- the current expensive pursuit of the lowest possible radiation levels is in the best interest of no one. The internationally recommended levels should be changed early and substantially.

Fossil fuels, the energy source of choice in the 20th century, are now acknowledged to pose a long-term global threat to human life on Earth, far in excess of any local accident. Nuclear technology offers a base-load power source that renewables in general cannot. Regulations designed to placate the irrational fear of radiation should not stand in the way of the future. Such fear is a matter for education.