



# Department of Medical Research (Lower Myanmar)

*Bulletin*

January, 2009

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<i>The objective of this Bulletin is to disseminate international news about health and medicine, developments, activities in medical and health research in DMR (LM). The Bulletin is published monthly and delivered to township hospitals. The Editorial Committee, therefore, invites contributions concerning information about research activities and findings in the field of medicine and health.</i>	Everything putting in the mouth has the potential to interact with something else. The medication that is taken by mouth travels through the digestive system in much the same way as food and herbs taken orally do. So, when a drug is mixed with food or another herb, each can alter the way the body metabolizes the other. Some drugs interfere with the body's ability to absorb nutrients. Similarly, some herbs and foods can lessen or increase the impact of a drug. In our country, many people take traditional medicine which are reputed as digestive compound such as (လျှက်ဆား၊အစာကြေလေနိုင်ဆေး၊လေဆေး) are taken together with antidiabetic, antihypertensive, diuretic and other drugs. Thus, it is crucial to know about the interaction between popular herbs, foods, and prescribed and over-the-counter drugs.
Please address all your correspondence to:  <b>Publication Division Department of Medical Research (Lower Myanmar) No. 5, Ziwaka Road Yangon 11191, Union of Myanmar ☎ 375447, 375457, 375459 Ext: 274</b>  <b>Published by the Editorial Committee Department of Medical Research (Lower Myanmar)</b>  <b>Restricted for Internal Use Only</b>	Followings are the examples of interaction between licorice (Nwe-cho) and drugs. Licorice (Nwe-cho) is the common ingredient of above Myanmar traditional medicines. Licorice may increase the risk of bleeding or potentiate the effects of warfarin therapy [3]. Case of a 61-year-old man who was admitted to hospital because of severe hypokalemia, rhabdomyolysis and high blood pressure. Severe hypokalemia may lead to rhabdomyolysis. The plasma aldosterone concentrations were low and the plasma renin activity was suppressed. A diagnosis of apparent mineralocorticoid excess, attributable to licorice and grapefruit juice ingestion, was made. Glycyrrhizic acid and glycyrrhetic acid, its hydrolytic product, in licorice extracts, and polyphenols, in grapefruit juice, can inhibit 11 beta-hydroxysteroid dehydrogenase type 2, the enzyme that converts cortisol to cortisone [4]. Heavy licorice (glycyrrhizin) consumption has been associated with shorter gestation. Heavy glycyrrhizin exposure was associated with preterm delivery and may be a novel marker of this condition [5]. So it should not be used in pregnancy. Licorice may interfere with either digoxin pharmacodynamically or with digoxin monitoring. Licorice can offset the pharmacological effect of spironolactone [6].

It may cause headaches, elevated blood pressure (hypertension), lethargy, stomach upset, diarrhea, facial puffiness, ankle swelling, edema (fluid retention), grogginess, weakness or shortness of breath [7]. Therefore, do not use licorice root if you have diabetes, edema, heart disease, high blood pressure, kidney disease, severe menstrual problems, glaucoma or history of stroke. It should not be used on a daily basis for more than seven days in a row as it can affect the body's electrolyte balance, retaining sodium but depleting the body of potassium [7]. This in turn can lead to high blood pressure and edema. Consult your practitioner for advice. Licorice is contraindicated for people with potassium problems [8]. Monitoring of blood pressure and electrolytes and increasing potassium intake are suggested in case of

patient taking licorice. Women who suffer from premenstrual syndrome (PMS) should not use licorice during PMS time due to its ability to cause water retention or bloating [7].

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## Soybeans and Fertility

Soybeans are an important global crop, providing oil and protein. The bulk of the crop is solvent-extracted for vegetable oil and then defatted Soymeal is used for animal feed such as poultry and swine and most recently the aquaculture of catfish. A small proportion of the crop is consumed directly by humans. Soybeans are native to East-Asia but only 45 % of soybean production is located there. The leading producers are America, Brazil, Argentina, China, and India. Soybeans are one of the "biotech food" crops that have been genetically modified, and GM soybeans are being used in an increasing number of products. In 1997, about 8% of all soybeans cultivated for the commercial market in the United States were genetically modified. In 2006, the figure was 89%. Soybeans are broadly classified as "vegetable" (garden) or field (oil) types. Tofu and soymilk producers prefer the higher protein cultivars bred from vegetable soybeans. Among the legumes, the soybean is pre-eminent for its high (38-45%) protein content as well as its high (20%) oil content. The major unsaturated fatty acids in soybean oil triglycerides are 7% linolenic acid (C-18:3); 51 % linoleic acid (C18:2); and 23% oleic acid (C-18: 1). It also contains the saturated fatty acids: 4% stearic acid and 10% palmitic acid [1].

In China, Japan and Korea, the bean and products made from the bean are a popular part of the diet. The Chinese invented tofu, and also made use of several varieties of soybean paste as seasonings. Japanese foods made from soya include: miso, natto and edamame. In Korean cuisine, soybean sprouts, called *kognamul* are also used in a variety of dishes. Soybean products appear in a large variety of processed foods. Common forms of soy (or *soya*) include soymeal, soy flour, soy milk, tofu, textured vegetable protein (TVP, which is made into a wide variety of vegetarian foods, some of them intended to

imitate meat), tempeh, soy lecithin and soybean oil. Soybeans are also the primary ingredient involved in the production of soy sauce (or *shoyu*) and the bean used in chinese fermented black beans, *douchi*. Infant formulas based on soy (SBIF) are used by lactose-intolerant babies and for babies that are allergic to cow milk proteins. The formulas are sold in powdered, ready-to-feed, or concentrated liquid forms. Soybeans are also used in industrial products including oils, soap, cosmetics, resins, plastics, inks, crayons, solvents, and clothing. Soybean oil is the primary source of biodiesel in the US, accounting for 80% of domestic biodiesel production [1].

Interest in the physiological role of bioactive compounds present in plants has increased dramatically over the last decade [2]. Of particular interest in relation to human health is the class of compounds known as the phytoestrogens, which embody several groups of non-steroidal oestrogens. The term phyto-oestrogen encompasses isoflavone compounds, such as genistein and daidzein, found predominantly in soya products and the lignans such as matairesinol and secoisolariciresinol, found in many fruits, cereals and in flaxseed. Soybeans contain the isoflavones (3mg/g dry weight); genistein and daidzein [4]. Phytoestrogens are strikingly similar in chemical structure to the mammalian oestrogen, oestradiol, and bind to oestrogen receptor (ER) with a preference for a more recently described ER beta [2].

There is ample evidence that shows that mammals exposed to oestrogens during critical periods of sexual development can suffer a drastic reduction in fertility. There is also strong evidence that soy phytoestrogens such as genistein can inhibit 17- $\beta$ -hydroxysteroid oxidoreductase, an enzyme which is required for the synthesis of testosterone and the development of the CNS-gonadal axis. There is also evidence that the soy

isoflavones genistein and daidzein are genotoxic to human sperm. It is quite possible, therefore, that phytoestrogens, along with other endocrine disrupting compounds such as DDT, may contribute to the worldwide decrease in male fertility.

Phytoestrogens have become a major component in the typical Western fast food diet over the last few decades. The use of Soy formula milk is of particular concern since the most vulnerable periods for oestrogenic insult are thought to be the pre and neonatal periods when irreversible damage can be on the developing germinal epithelium [3]. There are some studies that state that phytoestrogen in soy can lead to alterations in the proliferation and migration of intestinal cells. The effects of these alterations are unknown and more research is needed to answer the question of what effect phytoestrogens have on infants. Congenital abnormalities of the male genital tract are also increasing and soy phytoestrogens may be

implicated according to a study that found a higher incidence of birth defects in male offspring of vegetarian, soy-consuming mothers. Isoflavones such as genistein and daidzein demonstrate both estrogenic and weak anti-estrogenic activities and these activities may underlie the impaired fertility and reproductive tract disorders reported in animals exposed to high doses of isoflavones. Studies into the safety of phytoestrogens are urgently needed either to allay fears or increase awareness of the effects of our modern diet on future fertility [3].

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## What's the Fuss about Trans-fats?

### 1. What are trans-fats?

Trans-fats, or trans-fatty acids, are a type of unsaturated fat that act like saturated fats. That is, they are "bad" for our heart health because they raise the level of bad cholesterol in our blood. Most of the trans-fats we eat - some 64 percent- are created as a by-products of the process called hydrogenation, where food manufactures bubble hydrogen through liquid oils, turning them into solids to make cakes and pastries. This process improves food's shelf life, flavor and stability. Trans fats can also be produced by heating oil, and occur naturally in the meat and milk of ruminant animals such as cows and sheep.

### 2. Why are they so bad for us?

Large population studies have shown that people with a high intake of trans-fats have higher level of heart disease. Weight for weight, doctors believe trans-fat is much more dangerous than saturated fat. That's because not only does trans fat- like saturated fat - increase the level of "bad" or LDL cholesterol in our blood, it has an ability to lower the concentration of "good" or HDL cholesterol, which protects us against heart disease. Research has shown that replacing trans-fats with good fat could cut your risk of heart attack by a whopping 53 percent. There have also been some suggestions recently that trans-fat plays a role in diabetes and may promote allergies in children, but they jury's still out on this. The US National Academy of Sciences' Institute of Medicine has suggested the only safe level of trans-fat is zero.

### 3. Why all the fuss recently?

In 2003, Denmark became the first ever country to legislate against trans-fat in foods, banning all

products that contain more than two percent trans-fatty acids of total oil or fat in a food. Then, in late 2006, New York's Health Department required all of the city's 20,000 restaurants to phase out any artificial trans-fat, so that by the middle of this year every serve of food you buy in that city should have less than 0.5 grams of trans-fat. Media and public concern has sparked discussions with food industries about reducing levels further.

### 4. Where do we get trans-fat from?

While trans-fat occurs naturally in some meat and dairy products, it's not a good idea to severely limit these because then you would be cutting out on other important nutrients, says Claire Hewat, executive director of the Dietitians Association of Australia. What concerns dietitians most is the trans-fat that comes from the manufacturing process.

In countries like Australia, margarine manufacturers phased out oils containing trans-fats about ten years ago, and now only very cheap varieties contain them. But oils containing trans-fats are still widely used in the manufacture of products such as biscuits, cakes, buns and pies, as well as for deep-frying some fast foods. Since there's no requirement to label trans-fat levels on every food, it's hard to know how much you're eating. In 2005, Choice in Australia tested 55 processed foods and found plenty had levels high enough to significantly increase the risk of heart disease if they were eaten regularly.

### 5. What do they do to the heart?

Coronary heart disease is a major cause of death globally in most cases, it's caused by a condition called atherosclerosis, where fatty deposits build

up on the walls of the arteries, causing them to narrow and interrupt the flow of blood to the heart. Low-density lipoproteins- LDL cholesterol- are an important component of these fatty plaques. Studies have shown a clear association between consumption of trans-fats and high LDL levels. Trans-fats can also promote inflammation and have a role in other risk factors for heart disease. A review of the role of trans-fat undertaken for Food Standards Australia New Zealand (FSANZ) found a clear association between trans-fats and LDL, but pointed out that many of the studies did not distinguish between naturally occurring and manufactured trans fats.

In 2006, another review of the scientific literature published in the New England Journal of Medicine found a two percent increase in energy intake from trans-fat was associated with a 23 percent increased risk of coronary heart disease.

6. So, which are worse: trans-fats or saturated fats?

Weights for weight, trans-fats are worse. The World Health Organization says that to be healthy, no more than one percent of our daily calories should come from trans-fat and we should consume less than ten percent of calories from saturated fats. That means the biggest danger point in our diets is by far saturated fat. Claire Hewat is worried that all the types around trans-fat means people are losing sight of the real enemy: "For example, it would be the easiest things in the world to get rid of the trans-fats by switching to palm oil but that has 50 percent saturated fat. It's very important not to focus just on trans-fats."

The best advice, she says, is to work on getting your total consumption of saturated fat down. If you choose products with very small amounts of saturated fat, changes are you'll be bringing your consumption of trans-fats down, too.

7. Why not just ban all trans-fat?

Concern about trans-fat is becoming such a high-profile healthy issue that some governments are moving to ban them. In Australia, the federal government has taken a wait-and-see approach. That's partly because the food industry has been proactive in reducing trans-fat levels of its own accord. In Singapore, the Health Promotion Board has been in discussions with food manufacturers since 2004 about labeling the fat content of products and reducing levels further.

Hewat says it's easy to use different oils for frying, but not simple changing the ingredients of pastries and biscuits. "By saying 'stop this today', the product that people like to eat will just disappear," She says. Here, the big discussion is over whether the amount of trans-fat should be included on labeling.

8. What's the case for labeling?

If a product makes a health claim about its fat content -for example that is 97 percent fat-free or that it's cholesterol-free -it has to list its full fat profile. That's where you'll see information on fats such saturated, trans, polyunsaturated, monounsaturated and total fat. For every other food - including those that are likely to have high levels of trans-fat the only requirement is to list the amount of total and saturated fat. The argument against labeling is that if people focus too much on trans-fat, they may unnecessarily limit important food groups such as meat and dairy. "We must not base decisions concerning food supply on what is happening in countries like the US," says Hewat. However, senior food policy officer Clare Hughes in Australia believes consumers have the right to know what they're eating. "Not every biscuit will have trans fat. We should be providing people with information". FSANZ is now proposing to allow food manufacturers to claim that a product "Low in trans fatty acid and saturated fat can reduce the risk of heart disease."

9. What else is being done?

Most governments do not regulate trans-fats; however non-regulatory measures are in place to help reduce trans-fats. Many fast food companies including McDonald's, KFC and Burger King have started working towards such reductions. In Malaysia and Singapore, health awareness campaigns highlight the negative effects of trans-fat. The Health Promotion Board in Singapore also works with food manufacturers to re-formulate the composition of food products to achieve lower levels of trans-fat.

10. What can I do to minimize my own trans-fat intake?

You can bring down levels of naturally occurring trans-fats by trimming fat from meat and choosing lean cuts. "You can have lean meat even on a cholesterol-lowering diet, but make sure you don't eat the fat," says Dr Peter Clifton, who co-wrote the CSIRO Total Wellbeing Diet. Butter contains trans-fat and is also high in saturated fat, so using high-quality margarine is a good alternative. Steer clear of manufactured cakes and pastries, particularly chocolate biscuits and doughnuts, which have the highest levels of saturated fats. Other ways of staying healthy are to eat more fruit and vegetables, so you're less likely to be eating bad fats. Also, choose reduced-fat dairy products and try to avoid toasted mueslis for breakfast. Takeaways and fast foods can be healthy if you choose wisely. Deep-fried foods may contain trans-fat, especially if they came from a smaller chain or your local takeaway.

*Source: Helen Signy. Reader's Digest 2008 Nov; 57-62.*

## New Biomarkers for Brain Tumor Discovered

Researchers in the US and The Netherlands have discovered that cancer cells from a deadly type of human brain tumor called glioblastoma release tiny sacs containing proteins that traverse the brain-blood barrier and contain genetic material that could be used as biomarkers in new diagnostic tools and perhaps as new targets for treatments too. The study, which was published online on 16 November in the journal *Nature Cell Biology*, was the work of lead author Dr Johan Skog, who works in the laboratory of co-author Dr Xandra Breakefield, at the Neuroscience Centre of Massachusetts General Hospital (MGH), which is part of Harvard Medical School, and colleagues from other parts of Harvard Medical School and the Cancer Center Amsterdam. Using blood samples from glioblastoma patients, Skog, Breakefield and colleagues found that the glioblastoma cells released tiny blood-borne sacs called microvesicles or exosomes that carry a range of proteins and tumor-associated RNA. Some of these glioblastoma microvesicles or exosomes contained the cancer genes EGFRvIII and miRNA-21 that cause cells to proliferate, leading the researchers to suggest that they may serve as new biomarkers or drug targets for this deadly form of cancer. Skog explained in a press statement that glioblastomas shed enough exosomes to pass the blood-brain barrier and he and his colleagues were able to isolate them and: "Analyze the RNA transcripts and show how they might be used as biomarkers to guide targeted therapy and monitor treatment response." "Exosomes also may someday be used to deliver therapeutic molecules to the site of a tumor," he added.

Exosomes are a normal part of cell to cell communication and scientists were already aware that when tumors shed them they can change the environment of

cells to make it easier for tumors to grow. But this study's unique contribution is that it identifies the specific markers that do this for glioblastoma. For the study the researchers looked at tumor samples from three glioblastomas and found they shed exosomes carrying lots of proteins and RNA molecules that are important for cell proliferation and migration, development of blood vessels, and immune response.

Then they cultured the exosomes from the glioblastomas with normal (non cancerous) cells and found that they transferred tumor-linked RNA molecules (ie genetic material) into the normal cells which then started to make new proteins which are like the ones that help the exosome-delivered RNA to change the environment of cells. The researchers also analyzed tumor tissue and blood samples from 25 glioblastoma patients to study how glioblastoma exosomes might serve as genetic biomarkers of a tumor. This is how they found the EGFRvIII and miRNA-21 cancer genes. In two of the patients the EGFR mutation did not show up in the tumor sample but it was found in their blood samples, showing how it could be possible for a surgical biopsy to show a false negative. Skog, who is also an instructor in Neurology at Harvard Medical School said: "It is known that the effects of some anticancer drugs depend on a tumor's genetic mutational profile, so our results have broad implications for personalized medicine." He said it might be possible to use this method to fine tune treatments by using blood tests to monitor how a tumor's genetic profile changes in response to drugs. In the meantime Skog, Breakefield and colleagues are investigating whether exosomes shed by other types of tumor may also have similar properties and therefore open new doors to tumor diagnosis and treatments.

*Source: www.medicalnews today.com*

## Highlight on Useful Research Findings Applicable to Health

### Snakebite (by Dr. Tun Pe)

#### Poisonous snakebites of Myanmar with special references to the bites and case fatality rate (1998-2005)

Retrospective study of data collected by the Department of Health Planning on bites and case fatality rate of poisonous snakes of the whole country from 1998 - 2005 were analyzed. The objective of the study was to determine the trend, number of bites and case fatality rate of poisonous snake bites of the states and divisions. The average poisonous snakebites (1998-2005) of the whole country were 8107 (6529-9600) with a case fatality rate of 7.43% (4.93-8.82%). The yearly trend of the snake bite is on increase and Mandalay, Magway, Sagaing and Bago (W) Divisions have the highest numbers of snakebite ranging from 1001 to 2000 per year and Chin, Kachin, Shan (East

and North), Rakhine and Kayah States and Taninthayi Division, each has less than 50 per year. Townships with no report of snakebite are also highlighted. Ayeyawady Division has the highest case fatality rate 17.75%, followed by Rakhine State 10% and Magway Division 8.96%. The exceptionally high fatality rate (11-40%) of 24/26 townships of Ayeyawady Division needs to be investigated. The information obtained from the study will be useful for the policy makers and project managers concerned, in planning, distribution and in estimating the amount of antivenom required for the whole country.

*Reference: MHSRJ 2007; 19(2): 87-93.*

**News Related to Medical Research Activities in Myanmar**

**DMR (LM) Scientists Attending Regional or International Congress / Meeting/ Seminar, etc.**

No.	Name & Designation	Name of International Congress/ Meeting / Seminar etc.	Place	Funding Agency	Duration
1.	Daw Mu Mu Sein Myint Research Scientist Pharmacology Research Division	Myanmar Traditional Medicine Practitioners Congress	Nay Pyi Taw	Ministry of Health	2-3 December, 2008

**Consultants Visiting DMR (LM)**

No.	Name & Designation	Name of division visited	Duration
1.	Dr. Frederic Arieu Head of Molecular Epidemiology Unit, Pasteur Institute Cambodia	Parasitology Research Division	13-14 November, 2008
2.	Professor Dr. Masanori Kai Japan International Medical Centre, Japan	Bacteriology Research Division	20-25 November, 2008

**Seminars, Workshops, Scientific Talks, etc. held in DMR (LM)**

No.	Topics	Speaker's Name	Date	Place
1.	Quality assurance and quality control in diagnostic laboratories	Dr. Khin May Oo Experimental Medicine Research Division	10-12-08	SRC Lecture Theatre
2.	Dengue collaboration with the Institute of Health and Biomedical Innovation, QUT	Dr. Hlaing Myat Thu Virology Research Division	17-12-08	SRC Lecture Theatre
3.	Current trends in treatment of leukemia in Japan	Dr. Masao Tomonaga Nagasaki University, Japan	22-12-08	Auditorium
4.	Cluster randomized trial: Designed analysis (Multi level analysis)	Dr. Ohnmar Epidemiology Research Division	24-12-08	SRC Lecture Theatre

- ဆေးအဆိပ်အတောက်ဖြစ်ခြင်း (**Poisoning**) နှင့် ပတ်သက်သည့်သတင်းအချက်အလက်များ သိရှိလိုပါလျှင် ဆေးသုတေသန ဦးစီးဌာန (အောက်မြန်မာပြည်)ရှိ **အမျိုးသားအဆိပ်ထိန်းချုပ်ရေးဌာန** (ဖုန်း-၃၇၉၄၈၀) သို့မဟုတ် ဒေါက်တာသော်ဇင် (ဖုန်း-၀၉ ၅၁၃၆၇၀၈) သို့ ဆက်သွယ်ဆွေးနွေးနိုင်ပါသည်။
- ဆေးသုတေသနဦးစီးဌာန (အောက်မြန်မာပြည်)၏ **'ကာကွယ်ဆေးနှင့်ရောဂါရှာဖွေရေးဆေးခန်း'**တွင် အသည်းရောင်အသားဝါ ဘီကာကွယ်ဆေးထိုးနှံပေးခြင်း၊ လိုအပ်သောစစ်ဆေးမှုများနှင့်ခါတ်ခွဲစမ်းသပ်မှုများပြုလုပ်ပေးခြင်း၊ အသည်းရောင်အသားဝါဘီပိုး/စီပိုး သယ်ဆောင်သောလူနာများအား ဆွေးနွေး၊ အကြံပြု၊ လမ်းညွှန်၊ ကုသပေးခြင်းများကို နေ့စဉ်(ရုံးဖွင့်ရက်) နံနက် ၁၀နာရီ မှ ညနေ ၃နာရီ အတွင်းဆောင်ရွက်ပေးနေပါသည်။
- ဆေးသုတေသနဦးစီးဌာန (အောက်မြန်မာပြည်)မှ သုတေသနပညာရှင်များနှင့် ကျန်းမာရေးဦးစီးဌာန၊ ဗဟိုအမျိုးသမီးဆေးရုံကြီးမှ သားဖွားမီးယပ်အထူးကုဆရာဝန်ကြီးများ ပူးပေါင်းဆောင်ရွက်သော **သားအိမ်ခေါင်းကင်ဆာစမ်းသပ်ဖော်ထုတ်သည့်ဆေးခန်း** ကို ဆေးသုတေသနဦးစီးဌာန (အောက်မြန်မာပြည်)တွင် ဖွင့်လှစ်၍ စမ်းသပ်စစ်ဆေးလိုသူအမျိုးသမီးများကို တနင်္လာနေ့ နှင့် ဗုဒ္ဓဟူးနေ့ နံနက်ပိုင်း ၁၀နာရီမှ ၁၂နာရီ အတွင်း အခမဲ့စစ်ဆေးပေးလျက်ရှိပါသည်။

သို့

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ကျန်းမာရေးဝန်ကြီးဌာနမှဝန်ထမ်းများအားဖြန့်ဝေပေးပါရန်မေတ္တာရပ်ခံအပ်ပါသည်။