

In this issue

Food Security Indicators

Assessing the Indian position

India has come a long way in its resilience to famines caused by floods, droughts and wars. Death from hunger has reduced. Food production has shot up after the Green Revolution and, today, there is surplus stock of grains. Private transport and distribution systems have made people less dependent on the public distribution system. Yet hunger and malnourishment continue to exist.

In recent years, the concept of food security has become stronger with the development of indicators. Food availability is one indicator but it does not ensure accessibility to food. And accessibility to food does not necessarily mean that it is utilized for the health and well being of the citizens or that the diet is balanced with adequate proteins, vitamins and minerals. Moreover, the danger of famines – caused by natural or manmade calamities – cannot be ruled out; the situation is not yet stable.

A General Article on **page 632** in this issue compares the food security indices of India and other similar countries to point out the areas that need the attention of policy makers and administrators.

Treating Wounds

New materials and methods

The age-old methods of treating wounds with herbs may, at times, lead to infections and cause complications. So, nowadays, hospitals and clinics use lint, gauze and cotton wool as a protective barrier along with drug molecules that do not allow bacteria to proliferate. But then, the method allows evaporation of exudates: the wounds dry up too quickly. A moist environment and a supply of oxygen could help wound healing. Moreover, changing the dressing is a painful experience. Thus, the method has severe limitations.

Recent research has thrown up a variety of new techniques to speed up the process and to reduce pain and inconvenience to the patients.

Wound dressings based on hydrocolloids, alginates and hydrogels, semi-permeable adhesive film dressings, foam dressings with adhesive properties on the edges, bioactive dressings, tissue engineered skin substitutes, solid lipid nanoparticles, liposomes, micro-emulsions, microsponges, low-level laser therapy and hyperbaric oxygen therapy... the list of new methods has been expanding rapidly in the last few years.

A Review Article on **page 641** in this issue examines the pros and cons of the new methods, materials and techniques that lead to quicker and less painful healing of wounds.

Waiting for the Bus

Predicting travel time

You are waiting for the bus in an Indian city. You know that the route has buses every 30 minutes. But you wait for more than an hour and, when the bus does come, you find that there are two more just behind it. And you wonder what happened.

In spite of the fact that the buses leave the terminal every 30 minutes, they often tend to bunch together on a route because of traffic snarls and the highly variable conditions that each bus encounters on the way. But then, can't we have a system where commuters get to know where the buses are and give the information to bus stops on the route? After all airports do that when flights arrive late, at least most of the time, don't they?

Yes, it is possible, says a Research Article on **page 700** in this issue. Buses can be fitted with GPS. The highly variable conditions on the roads can be tackled by the Kalman filtering technique; and machine learning algorithms, such as support vector machines, can be combined with Kalman filtering; if we incorporate input from GPS data, it will allow predicting travel time for buses in cities with variable traffic conditions.

Scientists in IIT Madras test this claim by using these techniques to predict the travel times of buses on a specific route in Chennai. The results are

fairly satisfactory – enough to reduce the anxiety and tension of the people waiting for the bus to some extent. With a little more research and development, we might soon have a mobile app that will tell you the expected time of arrival of buses before you start out from home.

Cryopreservation of Germ Cells

Preserving endangered fish species

The Indian major carp, rohu, is a tasty fish. So, harvesting it as a food item cannot be easily controlled. Naturally, the fish stock dwindles fast. Thus, there is a need to preserve the germ cell lines to protect the species. Cryopreservation of male and female gametes and germ cells is done in such cases.

But freezing living cells is a tricky business. If it is done too fast, the ice crystals that are formed would kill the cells. So cryoprotectants are added and the freezing is done at a slow rate. What is the maximum rate at which one can freeze the cells? And which cryoprotectant is the best for the purpose? Scientists from the ICAR-Central Institute of Freshwater Aquaculture and the Berhampur University, Odisha, joined hands to find out.

In a Research Communication on **page 739** in this issue they present the protocol and the differences in the viability using three different cryoprotectants. Their techniques can give more than 70% viability of cryopreserved cells. They transplanted the germ cells into the gonads of catla, an allogenic host. The transplanted germ cells attached themselves to the host gonad and proliferated. This gives hope for those who are concerned about the protection of the fish species. The method is simple enough for even hatcheries to use, since it does not require complex laboratory equipment, except for an automatic programmable freezer.

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