Is new flu jab made in dogs' kidney cells most effective ever?

It might sound bizarre, but Britain's new vaccine could save thousands of lives...

By FIONA MacRAE

MILLIONS of Britons are struck down by flu each winter and thousands die, despite a jab being available.

Even when people have the jab, problems with its efficacy mean it often fails to protect against the virus.

But could this year be different? The release of a new, improved vaccine may mean we are better protected than before against flu.

Britain is the first country in Europe to introduce the Flucelvax Tetra jab. Unlike previous flu vaccines, it is not made in hens' eggs — and health officials and scientists say it could be more effective.

Research from the U.S., where it has been used for the past two years, found it was 36 per cent better at preventing flu than the conventional jab.

Here, the Joint Committee on Vaccination and Immunisation, which advises the Department of Health, says the new jab appears to be 'at least as good' and 'possibly better' than the hen's egg version.

Last year, some 15 million adults and children were immunised against flu in England. However, the vaccine failed more often than it worked; figures show it was effective in just 44.3 per cent of cases, and flu claimed almost 1,700 lives.

In the previous year, 2017-18, the vaccine worked just 15 per cent of the time and flu was blamed for more than 26,000 deaths. Combined with the effects of a colder-than-average winter, when heart attacks, strokes and other illnesses are more common, this led to the highest winter toll for more than 40 years.

Even the scientist who invented the modern flu vaccine in the 1960s acknowledged its flaws. Speaking in 2007, Dr Graeme Laver said: 'I have never been very impressed with its efficacy.

'It is better than nothing and I wouldn't want to advise people not to take it, but you can't rely on it doing any good.'

The main reason why the vaccine doesn't protect everyone is that there are numerous strains of flu — and the jab only protects against up to four.

The jab is reformulated each year to protect against the particular strains likely to be circulating in the forthcoming winter; strains causing illness in Australia provide a guide to what might hit the UK a few months later.

Picture: GETTY IMAGES

FLU'S ANNUAL TOLL

Year	Intensive care admissions	Deaths
2014/15	1,261	28,330
2015/16	2,173	11,875
2016/17	992	18,009
2017/18	3,245	26,408
2018/19	2,924	1,692

Source: Public Health England

BUT the predictions aren't always right. Occasionally, the virus mutates into a new strain that won't be covered by the jab. More commonly, a strain that wasn't troublesome — and so was not included in the vaccine — takes hold, leaving the vaccine a poor match.

Professor Ian Jones, a flu vaccine researcher from Reading University, says: 'The matching process has improved but it is still a best guess and so not always right.'

Problems with flu vaccine production don't end there.

The conventional process for making the vaccine is time-consuming, technically complex and relies on millions of hens' eggs.

Odd as it may seem, fertilised chickens' eggs provide a sterile, natural incubator for the flu virus to grow.

Each egg is injected with a tiny amount of the virus through a hole drilled in its top, and incubated at 37c for two days while the virus multiplies inside it.

The egg's top is then sliced off and the liquid inside the shell, which is rich in the flu virus, is sucked out.

With up to four different strains of flu — each grown in separate eggs — mixed together to form one dose of the vaccine, it can take 50 million eggs to create the UK's annual supply of the jab.

Sourcing enough eggs at the right time can be difficult.

Furthermore, not all strains of flu grow equally well in eggs, so sometimes scientists have to alter them slightly in the lab before putting them in the eggs.

In other cases, the virus naturally undergoes small changes while inside the egg, so the virus that comes out of the egg and goes into the jab isn't exactly the same as the one that is infecting people, which may make the vaccine less effective.

The new Flucelvax Tetra jab, from Maidenhead-based company Seqirus, dispenses with the need for eggs. Instead, the virus is grown in huge vats of cells in a plant in North Carolina, in the U.S.

The cells, which originate from a dog's kidney, have been adapted to grow and divide continually, removing the supply issue.

DOG kidney cells are already used to make vaccines against other diseases and the flu virus grows well inside them.

Crucially, the canine cells are more similar to human ones than chicken cells are, so the virus is able to grow inside them without mutating. This means jabs made in this way may offer better protection against flu.

An analysis by Seqirus of 1.3 million U.S. medical records found that its jab was 36.2 per cent more effective.

However, more research is needed to confirm the results.

'The final product is a bit closer to the real McCoy,' says Professor Jones. 'The cell-based vaccine is still only a small segment of the vaccine market but in future it may predominate.'

The new jab, which costs roughly the same amount as the egg-based version, is suitable for anyone aged nine and older, including pregnant women and adults with asthma, diabetes and other underlying health conditions. It is also suitable for those with egg allergies.

However, gelatine is used in the manufacturing process, so it is not vegan.

It is not known how many doses of the cell-based vaccine have been ordered by the NHS — most jabs offered in British surgeries and pharmacies this winter will still have been grown in eggs.

Professor John Oxford, a virologist at Queen Mary University of London, says it is too early yet to write off egg-based jabs, which have been used for about 50 years.

'I would go along and get what they have got,' he says.

And while the new vaccine may have several advantages, it still needs to be reformulated each year to match the circulating strains of flu, so work continues around the world to develop a vaccine that protects against all strains in a single jab.

'The hunt is very much on for the so-called universal vaccine,' says Professor Oxford. 'The magic one, the one we would all like to grasp in our hands.

'I think we will get there, I really do.'

WHO IS MOST AT RISK?

FLU can cause serious illness and kills up to 30,000 Britons a year. Most at risk are people with underlying conditions such as diabetes and heart disease, older people and pregnant women, all of whom are advised to have the jab.

Those with chronic health problems are more likely to develop pneumonia and other complications. Adults with asthma are seven times more likely than non-asthmatics to die if they catch flu, and for those with heart disease the risk is 11 times higher. If you have liver disease, the risk rises almost 50-fold.

Age also weakens immunity, which is why the elderly are more vulnerable to complications, while changes to the immune system, heart and lungs in pregnancy put mothers-to-be at extra risk. Flu is also dangerous for the unborn baby and can lead to a miscarriage, premature birth or stillbirth, the NHS warns.

Under-fives are more likely to be admitted to hospital with flu than any other age group, and are 'super-spreaders' of the virus.

The vaccine is suitable for almost everyone, although those with an egg allergy may have a reaction to flu jabs grown in eggs.