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Short Title Research

Raymond Fester: Early next year the Government will be publishing a league table of all the major brands of cigarettes arranged according to tar and nicotine content. At about the same time, two major companies are expected to make an announcement about a less hazardous cigarette with a low tar content. But we have recently come across some experimental results which may throw a new light on to this complex field of research into the relationship between cigarettes and lung damage. William Woollard reports.

William Woollard: In this country, research into the effects of smoking these things is carried out by two main groups of people. There's the tobacco industry itself which provides funds for the Tobacco Research Council and there's also a smaller more scattered group of scientists who get their funds from various sources and who may touch upon cigarettes as part of a broader research programme into, say, cancer. A month ago we began looking into some of this latter research and we thought it raised some disquieting questions.

Most people now accept that cigarette smoke can cause lung cancer. Few people with access to the research report have the slightest doubt but the key question of your setting up to reduce the danger to smokers is which part of that smoke constitutes the greatest threat to human lungs. Now the league table of cigarettes and the so-called less hazardous cigarettes, are both based on the assumption that tar is the main enemy. There is evidence to suggest that that assumption is, to say the least, dangerously inadequate. The main evidence against tar comes from experiments like this. The concentration

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of tar obtained from cigarettes is applied to the backs of mice. It produces skin cancers. We understand that this is a test still used by the Tobacco Research Council and we were unable to get permission to film the current form of the test in their laboratories, but some scientists who were on cancer research are increasingly doubtful about the validity of applying results from these tests on mice to human beings and human lung tissue. The test has produced conflicting results and it ignores the tar content of cigarette smoke and ignores the many other constituents.

The fact is that tar, although obviously dangerous, may not be the most dangerous element in cigarette smoke, and if this is so, the league table of cigarettes by tar content alone could be positively misleading to the public. Right, let's examine the evidence.

The Americans smoke slightly more than we do, their cigarettes contain on average the same amount of tar and yet they get only half as much lung cancer. Why? The French smoke slightly less than we do, their cigarettes contain on average more tar and yet they get only a third as much lung cancer. Why - what's the difference? Well, one main difference seems to be the ways in which the tobaccos are cured. Virtually all British tobaccos are cured in special ovens or kilns. The process takes about four days and at the end of it the tobacco looks like this. This is now ready for going into cigarettes. But most American and French tobaccos are cured in the open air. The processes take much longer and can last several months. These two techniques produce tobacco which have remarkably different chemical compositions and the key difference is in the amount of sugar.

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British cigarettes can contain as much as 20% sugar. American cigarettes on average about 10% and French cigarettes as low as 2% or 3% of sugar. Now that takes us to the work of Professor Hisen of the Cancer Research Institute in London.

The work here suggests that the higher the sugar content of the cigarette, the more dangerous it is. This is a cigarette smoking machine. The cigarette smoke is blown into cages holding five rats. The experiment lasts three hours and then the rats get a breather until the next day. Both the tar and the sugar content of the cigarettes are varied. After two months smoking twenty-five cigarettes a day, the rats' lungs are examined - the result, regardless of tar content, the rats smoking cigarettes with the higher sugar content had very much more lung damage.

So what explanation is there for this really startling result? Well, there are two, each of which reinforces the other. Let's take them separately. Cigarettes that are low sugar content tend to produce alkaline smoke. Cigarettes with a high sugar content, an acid smoke and the presence of this acid makes it difficult for your body to absorb the nicotine. Now whatever excuse you're making to yourself, you're smoking cigarettes because you want that nicotine. So if it's the British style high sugar cigarettes, you tend to smoke more and puff harder, with the result you get more of those poisonous cancer producing substances deep into your lungs. Well, that's the first explanation and the second one takes us all the way down to Plymouth, to the work of Dr. Braven. He's been working on the chemical reaction between cigarette smoke and the individual cells of the lung tissue.

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Every cell contains a substance called 'cysteine', believed to be an important part of the cell's natural defences against cancer. Dr. Braven's work suggests that cigarette smoke reacts with this cysteine and to study the action, he prepares a sample for analysis.

He's found that one of the substances produced by sugar burning in cigarettes, a substance known as 'acetaldehyde' actually breaks down the protective cysteine, so the greater the amount of sugar in a cigarette, the greater the amount of cysteine removed and the more the cell is exposed to attack by cancer triggering substances. But there's another key point. One group of cancer triggering substances with the rather curious name of 'free radicals' is now known to be produced by burning sugar in cigarettes. These results were first published four years ago, they were met by a deafening silence.

So where does that leave us? Well, neither of these two pieces of research on sugar is by itself conclusive, but together we suggest they make a strong case for intensive research into the sugar content of cigarettes and as far as we know, the only research going on at the moment will come to an end in two months' time. There seems no doubt that whatever the danger, people will go on smoking, but isn't it perhaps worthwhile underlining just one point about that so-called league table of cigarettes that's going to be displayed in tobacconists' shops in January - the cigarettes at the bottom of that table, the ones with the least tar content, will appear to be the least dangerous, but they're also the ones with some of the highest sugar content.

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