from Britain — where hormone use is controlled under the 1968 Medicines Act but not banned — has fallen to a trickle in a business normally worth £500,000 a week.

Last Tuesday agriculture ministers of the European Community tried to take a grip in the affair by promising that Commission officials would devise a scheme — within a couple of months — for uniform testing of hormone levels in meat throughout the

EEC hormone law

Belgium, Denmark, France, Italy and the Netherlands already have a total ban on the use of natural or artificial hormones, but avoidance is thought to be commonplace. Belgium, France and West Germany take the view that a partial relaxation of the ban in favour of natural hormones — oestradiol and testosterone — would stop the abuse of the synthetic hormone which can be injected directly into the muscle as an oily, crystalline suspension, and is not easily detected by visual inspection of the meat after the animal is slaughtered; other hormone preparations, however, are administered as pellets implanted prominently in the ear. The ear is discarded at the slaughterhouse, but injected muscle will find its way straight to the table — or the baby food.

West German legislation, at present, distinguishes a list of hormones which may be administered — the positive list — and a list which may not — the negative list. On the latter are those which have an oral oestrogenic activity of more than one-fifth that of DES, so banning DES, the related hexoestrol, and two other artificial oestrogens. On the positive list at less than one-fifth the activity are the natural oestradiol and the artificial agent zeranol.

In Britain, the Medicines Act allows licensing of hormone preparations by the Veterinary Products Committee, under the Ministries of Agriculture and Health. Under these licences zeranol and hexoestrol are on free sale to farmers; and Hoechst's Finaplix (an androgen used in beef production) and Implixa (used for veal) administered by vets. The drugs may not be administered within at least 60 days of slaughter (although the drugs firms are pressing to reduce this period). The Pharmaceutical Society has the statutory authority to police the proper use of the drugs.

DES is no longer used in veal or beef production in Britain, although it is used occasionally in pig farming. One veal producer for the small — 70,000 head a year — British home market, Philip Paxman of Volac Ltd, said last week that he had stopped using hormones at all because of public pressure; and they are rarely used in the 300,000 head export market, he believes, because calves are shipped at 4–6 weeks old for fattening on the continent.

EEC. Despite great pressure from Italy, however, the ministers drew back from imposing a total ban, but will not easily agree on the directive they have asked for.

UK specialists in the use of sex hormones in farming argue that any proposed European legislation should distinguish between artificial agents and natural steroids (like oestradiol and testosterone); and that the use of natural steroids should be limited to tissue levels of around $1 \text{ in } 10^9$ — similar to those found in untreated farm animals. For the synthetic anabolic agents, and their frequently unknown residues, they should be shown to be non-toxic and non-carcinogenic before licensing.

European consumers unions, however, represented in Brussels by the Bureau Européen des Unions Consommateurs (BEUC) are pressing hard for all hormone use for meat production to be banned. It is too difficult for a policing authority to distinguish natural from unnatural hormones, says BEUC, so both should go. If agreed, this would have a big impact on beef production in the UK, which in the past few years has come to depend on hormone supplements for its profits, and would cause pressure to increase the use of antibiotics which have a similar effect on weight gain.

And perhaps Italy should worry more about olive oil than veal. According to one pharmaceutical company spokesman, vegetable oestrogens — of one-hundredth or so the bioeffectiveness of oestradiol, are present in olive oil at such a high level that the consumption of 50–100 g of olive oil a day would reverse an ageing woman's post-menopausal changes. But then if Italy can ban veal, it can probably ban olive oil too.

Robert Walgate

Polish farming

More meat to eat?

Agriculture is an extremely sensitive issue in Poland. After all, it was the announcement of increases in the price of meat products on 1 July that led to the recent wave of industrial unrest. Speaking last week at the Olsztyn Agricultural-Technical Academy, the Polish President, Henryk Jablonski, explained that what Polish agriculture needs is a robust, up to date and consistent farm policy, which will take into account the needs of development, technical equipment and the "fullest possible utilization" of scientific achievements. In particular, there is a pressing need for people of "considerable professional qualifications and social dedication" to implement research and guide agricultural development.

Under clause 6 of the Gdansk accords, the Polish government undertook to create "lasting prospects for developing peasant family farms which are the foundation of Polish agriculture". The greater openness of information stipulated by clause 3 of the same accords means that for the first time

official figures comparing the performance of state and private agriculture are being made available to the general public. Some 75 per cent of Polish agricultural land is still in private hands — some 3 million family farms of which barely 400,000 exceed 10 hectares. A minimum of 15–20 hectares is considered necessary for really efficient farming in Polish conditions, hence the large state farms would be expected to have the most advantages particularly because the state sector receives 64 per cent of all investment in agriculture. Yet, according to the official figures for 1979 (quoted by Leszek Chmielowski in *Zycie Warszawy*, 23 September), the state sector uses 2.5 times more chemical fertilizers and 2.6 times more concentrated feedstuffs to give the same amount of produce.

Chmielowski suggested that subsidies to state farms should be reduced, administrative costs minimized and unrealistic plans phased out. The land fund (largely made up of former private farms handed over to the state in return for a pension by elderly farmers without an heir eligible to succeed them) should not, said Chmielowski, simply be used to increase the area of (often unproductive) state farms, but should be made available to all private farmers who wish to expand.

Nevertheless, the members of the new "self-governing" farmers' union feel that Chmielowski's proposals do not go far enough. He stressed, for example, that the state sector, properly organized, still has "an important and growing role to play". But as Wieslaw Kecik, a young intellectual temporarily coopted as an "assistant" to the new union, explained, the greatest deterrent to the ambitious private farmer is his lack of security of tenure. Official policy, since the early 1970s, has aimed at "collectivisation without loss of production". If the state sector is to grow, the private farmers feel, it can only do so at their expense.

Moreover, said Mr Kecik, there are considerable price differentials in favour of the new sector. The private farmer must pay more for all essentials, and receives lower prices for his produce, except for a few "commercial" crops such as rape-seed and flax. Abolition of such inequalities, and the guarantee of land tenure, "must be", said Mr Kecik, "basic postulates of the new self-governing farmers' union".

The day after Chmielowski's article appeared, the Prime Minister, Josef Pinkowski, addressed a meeting of farmers and agricultural workers in terms of apparent reassurance. After calling on all those engaged in agriculture and its ancillaries, including research, to increase their efforts, Pinkowski indicated that the government would raise funds to create favourable conditions for "the whole of agriculture — all productive private farms". "We should like every farmer to feel that his work is secure", he added. "We want him to know that his intentions and production plans, his desire to

modernize his farm and to increase its productivity, will meet with continuous support from the State."

Last Saturday, at the meeting of the Party Central Committee, First Secretary Stanislaw Kania was even more forthcoming. "Individual peasants carry the Society", he said. "We shall ensure that every peasant is certain of his ownership and his farming tenure."

The next few months should show how far practical policy implements these assurances. **Vera Rich**

Kopek interferon

Last week, the Soviet news agency TASS announced that interferon can be purchased in any Soviet drug store for 56 kopeks per ampoule. The Soviet Union, said TASS, was the first country to produce interferon commercially, and for more than a decade Soviet doctors have been using interferon to prevent influenza and other virus diseases of the respiratory tract. Soviet doctors, said TASS, also use interferon against leukaemia and viral skin diseases. A patent for interferon production has been purchased from the Soviet Union by Japan.

What the TASS announcement does not make clear, however, is the extremely low dosage in the 56 kopek ampoule. Samples analysed in Western laboratories contained dosages of the order of 1,000 units or less. The market price of Finnish interferon is US \$25.00 per million units. At 64.4 kopeks to the dollar, Soviet interferon is therefore by no means competitive.

A careful reading of the TASS interview with Dr Valentin D. Solov'ev, moreover, reveals that studies on leukaemia, skin diseases, and also the veterinary use of bovine and porcine interferon, are still at the experimental stage. It is only the interferon nose-drops, which Dr Solov'ev himself pioneered in 1968, that are in regular use. However, Western experts find it difficult to understand the discrepancy between their results and those of Dr Solov'ev. In the West, interferon has been used successfully to prevent respiratory virus infections, but only at high doses and in patients with little or no natural resistance.

As far as mass prophylaxis is concerned, as the *British Medical Journal* observed recently, since interferon, like any intranasal liquid, has only a short half-life in the nasal cavity, but needs long-term contact with the nasal epithelial cells in order to make them more resistant to virus infection, "it is therefore difficult to understand how... nose drops containing a low titre of human leukocyte interferon could cause the degree of protection under epidemic conditions reported by Dr Solov'ev".

Vera Rich

Gulf pollution

UN's other worry

War is the greatest immediate threat to the Middle East — but the destruction of its fragile water supply, the Gulf itself, must be next. At the end of this month local marine scientists meet in Kuwait, next door to the Iraq/Iran conflict, to pledge research spending of up to \$5 million over two years to find out exactly what is happening to the waters of the Gulf.

The long-term development of the region, the Gulf States have recently recognized, depends on proper environmental management of the Gulf and its coastal regions; yet little is known of its ecology, oceanography or meteorology. The water of the Gulf is needed for agriculture, coastal industries, and for drinking, yet the highest density of tankers in any ocean discharges its ballast into it, and many industries such as desalination plants with their associated chloralkali works (using mercury catalysts), aluminium smelters (emitting hydrogen fluoride), fertilizer plants (emitting ammonia), and refineries (sulphur dioxide and hydrocarbons) belch out completely uncontrolled emissions. Already seafood is frequently tainted with oil, and city environments have

Gulf States. Sewerage networks and treatment plants will serve the whole of Kuwait by 1982, Qatar by 1985. But Bahrain's system is not planned to be complete until 2008, and Saudi Arabia's treatment plant on the Gulf is overloaded.

Hence the effort, catalysed by the Regional Seas Programme of the United Nations Environment Programme (UNEP) to undertake research into the sources and impact of pollutants. At present there are relatively few institutes in the region capable of doing the research, but the picture — UNEP estimates — will be "drastically changed" within a year. UNEP, with its experience in the Mediterranean pollution programme, will help with training, but the Gulf States will jealously guard their technical independence: they have no wish for "expert" teams descending from outside.

At Kuwait, seven research projects will be discussed. The most likely to be funded concerns oil: what are the principal sources of oil pollution in the Gulf, how is the oil distributed, and what are its effects on human health and the marine and coastal ecosystems? But to understand this question, the basic physical and chemical oceanography of the Gulf must be studied, and the biological balance of the sea understood.

Meteorology is also important. The

Kuwait Harbour, twentieth century skyline

deteriorated markedly in the past two or three years.

There are also at least 20 major industrial development regions around the Gulf coast, enjoying the world's greatest rate of development, and populations are flooding to these areas from the interior. Often the legal or institutional mechanisms do not exist to control pollution. And all this is threatening a sea on average only 35 metres deep, which evaporates more water than it receives from river run-off. (The Indian Ocean contributes the balance, through the Straits of Hormuz.)

Sewage is coming under control more rapidly than other pollutants, because of the existence of international contracting companies which are selling systems to

"Shamal" winds blow dust which sediments much of the surface oil; Kuwait suffers frequent calms and temperature inversions which trap airborne emission. Coastal mining is affecting wave erosion and sedimentation patterns, which could in turn affect access by the supertankers; Gulf currents at all depths must be measured. What is the residence time of water in the various regions of the Gulf? This question affects the concentrations that pollutants might be expected to reach.

Other studies would measure the levels of heavy metals in economically important marine organisms; and investigate the distribution and sensitivities of plankton, the lowest level of the food chain.

Robert Walgate