surplus rather than to promote foods for health reasons.

Nevertheless, because many foods are currently marketed on health grounds, the agriculture directorate needs to take more account of health considerations when introducing and regulating such schemes. For example, the scheme to promote milk and other dairy products, with an annual budget of 10 million European currency units,^{4,5} has been criticised by members of the European parliament and others on the grounds that most of its funding has been used to promote whole fat rather than low fat dairy produce.

In 1993-4 the Butter Council in Britain received substantial funding from the scheme for a series of full page newspaper advertisements for butter, costing at least £900 000. The advertisements claimed that, because butter is low in trans-fatty acids, it is just as healthy as margarine, but they neglected to mention that butter also contains much higher levels of saturated fat (which is of equal, if not greater, importance in raising blood cholesterol concentrations).⁶ Two complaints to the Advertising Standards Authority that these advertisements were misleading were upheld.⁷ Furthermore, the advertisements may breach the union's own Misleading Advertising Directive⁸ on the grounds that they unfairly denigrate another product. Not surprisingly, the Margarine and Shortening Manufacturers' Association in Britain has questioned whether the advertisements should be funded by the European Union, and a final decision has yet to be made.

For the years 1994-5 and 1995-6 the European Union's scheme aims to boost consumption of liquid milk, but the emphasis is on whole milk rather than semiskimmed or skimmed milk.⁹ David Balfour from the National Dairy Council in Britain claims that it would be highly unlikely to get funding to promote low fat milk. Again, some of the materials funded under the scheme are flagrantly misleading. A booklet produced by the Spanish Federation of Milk Industries, for example, argues that "there is a direct relation between the milk different animals feed their offspring with and the brain size of these species: rhinoceros milk is low in fat and cholesterol and that animal is not very bright at all."¹⁰

The European Union not only sponsors misleading advertising campaigns for relatively unhealthy products but also seeks to offload surpluses of food by providing subsidies to special groups, such as schools, hospitals, and the armed forces. The public health directorate's report makes no mention of these schemes, but since Finland joined the union the issue of why the scheme to subsidise school milk should provide subsidies only for whole milk and semiskimmed milk and not for skimmed milk¹¹ has been the subject of considerable controversy in the Finnish press, and Finnish members

of the European parliament have raised the issue in the European parliament.¹²

It would seem unlikely that the policies of an organisation as large and complex as the European Union should have uniformly positive effects on health. One anomaly that the report cannot fail to notice is that the union continues to support the production of tobacco while at the same time it supports health education campaigns aimed at reducing cigarette smoking—for example, through the "Europe against cancer" programme. The report acknowledges a need to "take extensive account of the health factor" in the organisation of the tobacco regime but is unclear about how this can be achieved without reducing production of tobacco.

All in all, this first attempt to assess how health considerations are and might be taken into account when union policies are formulated leaves much to be desired. It must be hoped that next year's report will be more critical and balanced.

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- 1 European Commission. Report from the commission to the council, the European parliament and the economic and social committee on the integration of health protection requirements in community policies. Brussels: EC, 1995. (COM(95)196 final of 29 May 1995.)
- 2 Belcher P. From hype to reality? Report on health aspects of other EU policies. *European Public Update* 1995;12:3.
- 3 European Commission. Report from the commission to the council, the European parliament, the economic and social committee and the committee of regions on the state of health in the European Community. Brussels: EC, 1995. (COM(95)357 final of 19 July 1995.)
- 4 Commission regulation (EC) No 3582/93 of 21 December 1993 on detailed rules for the application of council regulation (EEC) No 2073/92 on promoting consumption in the community and expanding the markets for milk and milk products. *Official Journal of the European Communities* No L 1993 Dec 28:326/23.
- 5 Commission communication to the council. Action programme to promote milk consumption in the community and expand the markets for milk and milk products: 1995/96 milk year. *Official Journal of the European Communities* No C 1995 Jul 8:173/5.
- 6 Butter Council. Margarine is healthier than butter, the earth is flat and communism is a jolly good idea [advertisement]. *Today* 1994 Jun 13.
- 7 Advertising Standards Authority. The Butter Council. *Advertising Standards Authority Monthly Report* 1995;45:8-9.
- 8 Council Directive (EEC) No 84/450 of 10 September 1984 relating to the approximation of the laws, regulations and administrative provisions of the member states concerning misleading advertising. *Official Journal of the European Communities* No L 1984 Sep 19:250.
- 9 Written question E-2724/94 by Anita Pollack, subject: health and diet. Written question E-2749/94 by Mary Banotti, subject: human nutrition and health. Joint answer to written questions E-2724/94 and E-2749/94 given by Mr Fischler on behalf of the commission. *Official Journal of the European Communities* No C 1995 Jun 19:152/13.
- 10 Spanish Federation of Milk Industries. *Milk and dairy products in human nutrition and their effect on health*. Madrid: SFMI, 1994.
- 11 Commission regulation (EC) No 3392/93 of 10 December 1993 on detailed rules for the application of council regulation (EEC) No 1842/93 laying down general rules for the supply of milk and certain milk products at reduced prices to school children. *Official Journal of the European Communities* No L 1993 Dec 11:306/27.
- 12 Written question E-474/95 by Marjatta Stenius-Kaukonen, Riitta Jouppila, Paavo Vayrynen, Ullpu Iivari, Riitta Myller, Mikko Ronnholm, Heidi Hautala, Pirjo Rusanen, Kyosti Toivonen, Mirja Ryyanen and Ritva Laurila. Answer given by Mr Fischler on behalf of the commission, subject: milk programme for school pupils. *Official Journal of the European Communities* No C 1995 Jul 31: 196/31.

Computer based prescribing

Improves decision making and reduces costs

This month the *British National Formulary* goes electronic. Since it was first published in 1981 the paper version of the formulary has provided doctors and pharmacists with biannually updated information on all drugs that can be prescribed in Britain. It is now available on CD ROM.¹ The move is welcome because there is growing evidence that tools for computer based prescribing help doctors to make better and cheaper prescribing decisions.

Doctors in Britain prescribe drugs costing £3.3bn annually, £450m of which could potentially be saved.² But deciding

which drug to prescribe can be difficult.³ One in 20 admissions to hospital is for the treatment of side effects related to drugs or the results of drug interactions⁴ (perhaps due to the difficulties that doctors have in calculating drug doses⁵) or other prescribing problems.³

Various approaches to improving the quality of prescribing have been tested. Local formularies and visits by prescribing advisers seem to improve the appropriateness of prescribing and reduce the costs,^{6,7} and computer based prescribing seems to confer similar benefits. Almost all

general practice receptionists in Britain use computers to generate repeat prescriptions, and two thirds of general practitioners use computers to prescribe during consultations.⁸ By comparison, few hospital doctors use computers for prescribing.

Better accuracy and appropriateness

Tools for computer based prescribing range from existing general practice systems, such as those for repeat prescribing, through computerised textbooks such as the new electronic *British National Formulary*, to decision support tools that extract data from the patient's record and suggest a ranked list of suitable drugs.⁹ These more sophisticated decision support tools can improve the accuracy, appropriateness, speed, and cost of prescribing. Evidence from three randomised studies showed that use of decision support tools improved the accuracy of drug dosing,¹⁰ while ward pharmacists who used decision support tools in an American hospital made better choices of which antibiotic to prescribe.¹¹ British studies showed that using a computer for repeat prescribing saved just over a minute of medical time per prescription and led to 38% fewer phoned requests from patients and 5% fewer inquiries from pharmacists.¹² Cost savings of up to 30% were also documented.¹³

Computer tools have been associated with an 8% increase in generic prescribing¹⁴ and make prescriptions more legible and complete; prescribing data on "free" general practice computer systems were 95% complete, whereas handwritten notes were 42% complete.¹⁵ A randomised trial is in progress to assess the effects of an advanced decision support tool on the prescribing patterns among British general practitioners [RW, Proceedings of the annual conference of the British Computer Society Primary Health Care Specialist Group, 1993.] Preliminary findings suggest that the prescribing behaviour of general practitioners using the system is closer to that of expert doctors in that they select a higher proportion of appropriate, generic, and cost effective drugs.

Computer based tools assist prescribing in various ways, including by increasing legibility and routinely checking for potential interactions. Some general practitioners, however, find these checks overinclusive or too slow (even a 10 second delay is too long during a consultation¹⁶) and turn them off. Prescribing tools can also calculate the appropriate dose and suggest a suitable preparation; a systematic review of drug dose calculators is under way. To work effectively these decision support tools need a computerised list of patients' problems, allergies, and past drug treatment; the legalisation of paperless general practitioner records next April should mean that more doctors keep these data on computer. Preferential prescribing of certain drugs simply because they appear higher on a computer generated list is a potential hazard (G Hayes, personal communication), so lists should be ranked in order of each drug's likely effectiveness for the patient's condition.

Prescribing systems must include a complete, contemporary list of preparations; maintain an accurate prescribing record for every patient (this is invaluable when the government pronounces on the risks of certain drugs, as recently with the newer oral contraceptive pills); and must print out the prescription for the doctor to sign,¹⁷ as electronic signatures are not yet legal. Hospital clinicians may be put

off using these tools by insufficient space in clinic rooms, lack of funds to install computer workstations at every bedside, and previous experience with inadequate systems.

Several new developments are promised that should improve current systems. Full integration with electronic patient records,¹⁶ facilitated by the clinical terms project,¹⁸ will provide prescribers with more appropriate lists of drugs and patients with tailored leaflets to improve compliance.¹⁹ Once electronic signatures become legal and the NHS-wide network is complete, doctors will be able to send prescriptions electronically to a pharmacy, eliminating signed printouts and speeding follow up inquiries by pharmacists. Perhaps, one day, automated pill counters will even be able to dispense some drugs directly.

The new electronic *British National Formulary* contains the full text of the paper version with a more detailed seven level hierarchical table of contents and direct links from each drug's entry to its interactions. This is a landmark in the struggle to make prescribing more "evidence based," but its full potential will be realised only when the information is available in a more structured form for use with the new generation of decision support systems. The compilers of the *British National Formulary* have begun the enormous task of structuring our knowledge about drugs for use with computers. This important task is central to the next generation of decision support systems for prescribing, which will keep doctors and patients informed and help the NHS to manage its resources more effectively.

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- 1 Prasad A. *The electronic BNF*. London: BMA and Royal Pharmaceutical Society of Great Britain, 1993.
- 2 Audit Commission. *A prescription for improvement*. London: HMSO, 1994.
- 3 Barber N. What constitutes good prescribing? *BMJ* 1995;310:923-5.
- 4 Einarson TR. Drug-related hospital admissions. *Ann Pharmacother* 1993;27:832-40.
- 5 Rolfe S, Harper NJN. Ability of hospital doctors to calculate drug doses. *BMJ* 1995;310:1173-4.
- 6 Dowell JS, Snadden D, Dunbar JA. Changing to generic formulary: how one fundholding practice reduced prescribing costs. *BMJ* 1995;310:505-8.
- 7 Soumerai SB, Avorn J. Principles of educational outreach ("academic detailing") to improve clinical decision making. *JAMA* 1990;263:549-56.
- 8 Gallup Poll. *Computerisation in GP practices in England and Wales: 1993 survey*. Leeds: NHS Management Executive, 1993.
- 9 Wyatt J. Computer-based knowledge systems. *Lancet* 1991;338:1431-6.
- 10 Johnston ME, Langton KB, Haynes PB, Mathieu D. A critical appraisal of research on the effects of computer-based decision support systems on clinician performance and patient outcomes. *Ann Intern Med* 1994;120:135-42.
- 11 Evans RS, Classen DC, Pestotnik SL, Lundsgaarde HP, Burke JP. Improving empiric antibiotic selection using computer decision support. *Arch Intern Med* 1994;154:878-84.
- 12 Roland MO, Zander LJ, Evans M, Morris R, Savage RA. Evaluation of a computer assisted repeat prescribing programme in a general practice. *BMJ* 1995;311:456-8.
- 13 Sullivan F, Mitchell E. Has general practitioner computing made a difference to patient care? A systematic review of published reports. *BMJ* 1995;311:848-52.
- 14 Gehlbach SH, Wilkinson WE, Hammond WE, Clapp NE, Finn AL, Taylor WJ, et al. Improving drug prescribing in a primary care practice. *Med Care* 1984;22:193-201.
- 15 Jick H, Jick SS, Derby LE. Validation of information recorded on general practitioner based computerised data resource in the UK. *BMJ* 1991;302:766-8.
- 16 Wyatt JC. Clinical data systems. Part II. Components and techniques. *Lancet* 1994;344:1609-14.
- 17 Computer issued prescriptions. In: Prasad A, ed. *British national formulary*. London: BMA and Royal Pharmaceutical Society of Great Britain, 1995:5.
- 18 Buckland R. The language of health. *BMJ* 1993;306:287-8.
- 19 Raynor DK, Booth TG, Blenkinsopp A. Effects of computer generated reminder charts on patients' compliance with drug regimens. *BMJ* 1993;306:1158-61.

For information about how to obtain a copy of the electronic *British National Formulary* see the advertisement in this issue (opposite p 1183 in General Practice edition; inside back cover in the Clinical Research edition, and inside front cover in the Compact edition).