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| **Criteria Theme - Cold Storage** | | | | |
| L007 | All stored materials are permanently labelled with details of contents, expiry and ownership, in a manner which can be understood by others if the ‘owners’ are not available. | Cold storage devices are highly energy intensive – they can account for up to 5% of total laboratory energy consumption, and also create indirect consumption because their heat generation often requires additional cooling from ventilation air. They also take up floor space that could be used for other purposes. S-Lab research suggests that some of these impacts are unnecessary because unwanted or obsolete samples are being stored. Labelling is a prerequisite for avoiding this, and of course is also important for health and safety and regulatory compliance reasons | Personal observation. | Storage Policy see LG001 |
| L008 | All stored materials are associated with active uses, or are being kept because of specific archiving requirements. | Cold storage devices are highly energy intensive – they can account for up to 5% of total laboratory energy consumption, and also create indirect consumption because their heat generation often requires additional cooling from ventilation air. They also take up floor space that could be used for other purposes. S-Lab research suggests that some of these impacts are unnecessary because unwanted or obsolete samples are being stored. Labelling is a prerequisite for avoiding this, and of course is also important for health and safety and regulatory compliance reasons | Evidence of a system (hand-written or digital) which tracks the location of stored materials. | Stores stock packages   * **Fridge survey as part of lab environmental management system** |
| L009 | Stored samples and materials are stored at the highest feasible temperature for effective preservation. | Many biological samples are being stored at higher temperatures than necessary (e.g. ultracold freezers are often set to maximum settings such as -80C when -70 would be sufficient). Ambient temperature DNA storage technologies are also available. | Evidence of written policies/guidance on storage temperatures. Interview with lab user(s). NB Check if ultracold devices are set to lowest possible temperature and, if so, whether there is a clear rationale for this. | * **Policy on fridge usage and environmental induction** |
| L010 | All available space is utilised through use of appropriate racking, storage containers etc. | Many cold storage devices store fewer samples than they are capable of because of awkwardly shaped containers, poor racking etc. This is not only inefficient but also threatens sample longevity because there is more ingress of warm air when doors or lids are opened. | Evidence of use of modular or other devices to maximise space utilisation. Personal observation. | * **survey** |
| L011 | There is regular (at least annual) cleaning, defrosting and (for ultracold freezers) maintenance of devices. This includes cleaning heat exchange coils on fridges and freezers, and defrosting of any devices without auto-defrost. | The energy consumption of cold storage devices rises if circuits or interiors are frosted, or if they are not working effectively. | Interview with lab user(s). Evidence of maintenance contracts for ultracold devices. | **\* Policy for fridges & freezers** |
| L012 | Energy costs of new cold storage devices are quantified and incorporated into a whole life costing approach to new purchases. | When the lifetime energy costs are taken into account, it can be very cost effective to purchase more expensive energy efficient cold storage devices. Vendors should be able to provide consumption information although it is important to check that the operating conditions this is gathered under are the same as your laboratory. Estates staff may be able to provide support for the incremental cost differences between ordinary and efficient devices. | Interview with lab user(s) and, possibly, procurement staff. Evidence that energy costs were considered in any purchases over the last 12 months, either directly or indirectly by purchasing from a scheme which has done this. NB If no recent purchases, treat as non applicable. | * **Stores staff look for the most cost effective – energy efficient option in line with the QUB Supplier Support Guidelines** |