

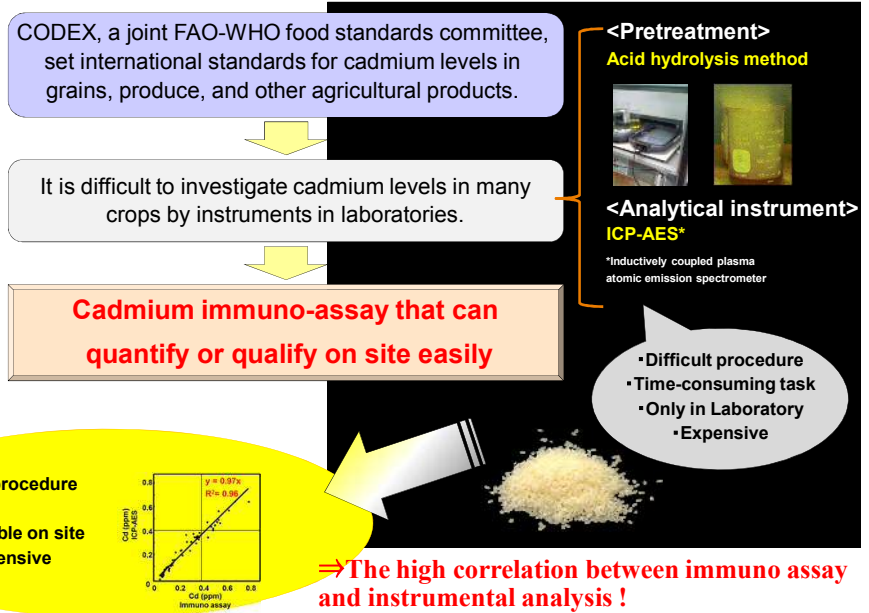
DEVELOPMENT OF TEST KITS FOR RAPID AND SIMPLE DETERMINATION AND VISUAL EXAMINATION OF CADMIUM IN RICE BY IMMUNOCHROMATOGRAPHY USING ANTI-(Cd-EDTA) ANTIBODY

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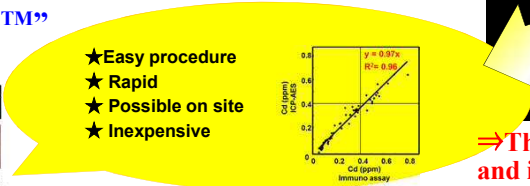
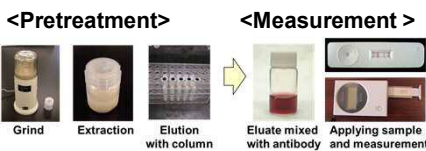
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1. Cadmium is one of the heavy metals which are contained in zinc ore, and is used in composition metals, metal plating, and to make pigments and batteries. It can get into human bodies by eating and drinking cadmium-contaminated foods or water and by breathing cadmium contaminated air. The greatest concern is from exposure to lower doses of cadmium over a long period of time. The lower and long-term exposure to cadmium through air or through diet can cause kidney damage, and lead to osteomalacia. Also, the International Agency for Research on Cancer (IARC) has classified cadmium and cadmium compounds carcinogenic to humans (Group 1).

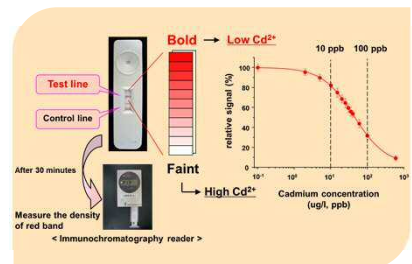
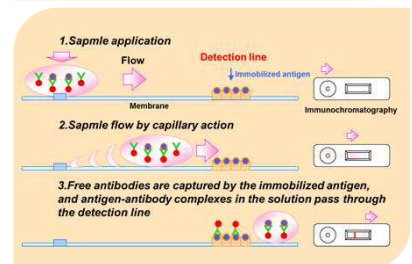
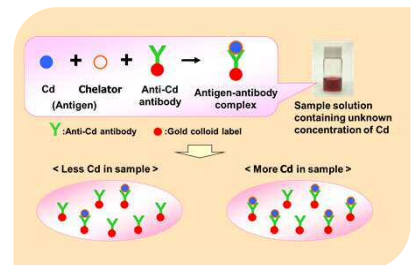
2. Why did we develop the cadmium immunoassay ?



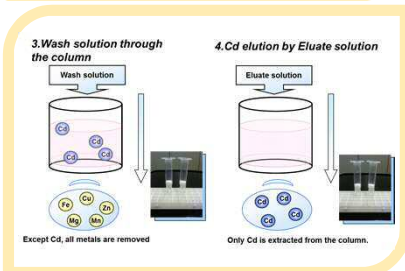
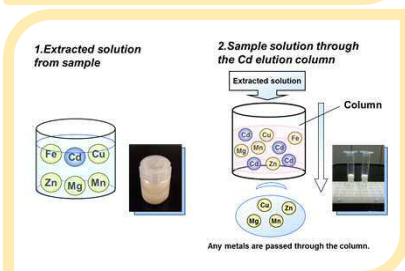
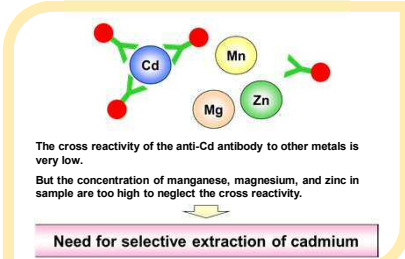
3. Determination kit "Cadmirre™"



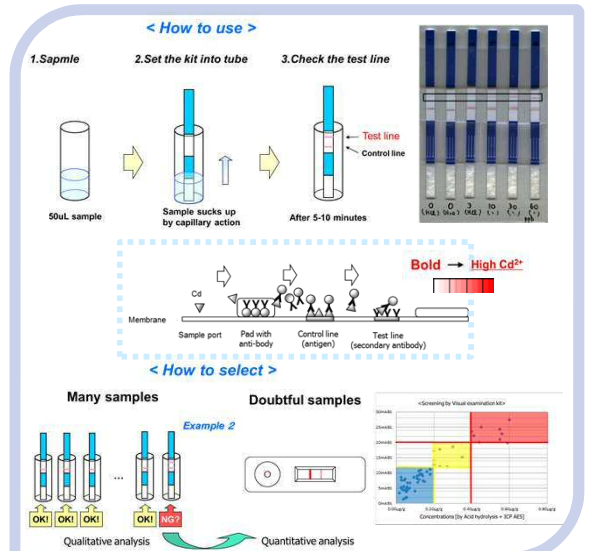
3.1 Principle of cadmium assay With immunochromatography



3.2 Pretreatment of the sample for the assay of cadmium



4. Visual examination kit



5. Conclusion

We developed two test kits for survey of cadmium-contaminated food and water; determination kit for cadmium, "Cadmirre™" and a visual examination kit. Both kits are simple and rapid on-site test methods by immunochromatography using anti-(Cd-EDTA) antibody. These methods do not need expensive instrument for analysis (ex., atomic absorption, inductively coupled plasma-atomic emission spectrometry, inductively coupled plasma-mass spectrometry etc.).

The determination kit for cadmium, "Cadmirre™" consists of a pretreatment column, device for immunochromatography, handy type detector, and some reagents and apparatus. Its measurement range is from 0.1 to 0.6µg/g for cadmium concentration in rice, and it correlates highly with the results of determination by instrumental analysis (R²=0.96). This kit has applicability to wheat, soybean, spinach, leek, okra and eggplant. Visual examination kit is even simpler, rapid and low cost monitoring technique to check the cadmium-concentration. This kit also uses the technique of immunochromatography with anti-(Cd-EDTA) antibody, but it does not need a detector. We conducted screening examinations of brown rice, and evaluated the standard cadmium value of rice (0.4µg/g). As a result, there were no false-negatives and false-positives.